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BUSINESS AVIATION

fact book

NATIONAL
BUSINESS AIRCRAFT
ASSOCIATION, INC.

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Statistical totals in the following pages will vary because of the differences in data sources, differences in time frames and differences in source definitions. The components of general aviation, of which business aviation is but one, are not always defined in the same way by every aviation source.

SECTION 1
Business Aviation and the NBAA

Business Flying

NBAA has defined its *corporate members* as "Any commercial or industrial enterprise (corporation, company, partnership, financial institution, proprietorship or individual) which is engaged in business, commerce, trade or industry, and which owns or operates United States registered aircraft, not for hire, flown by pilots having current professional qualifications, as an aid to the conduct of its business."

Its *business members* are defined as "Any commercial or industrial enterprise (corporation, company, partnership, financial institution, proprietorship or individual) which is engaged in business, commerce, trade, or industry, and which owns or operates United States registered aircraft as an aid to the conduct of its business, not for hire, flown by pilots having at least a currently valid commercial license and a currently valid instrument rating."

The FAA describes business transportation as "use of an aircraft not for compensation or hire by individuals for the purposes of transportation required by the business in which they are engaged."

Corporate transportation as described by the FAA is "any use of an aircraft by a corporation, company, or other organization for the purposes of transporting its employees and/or property not for compensation or hire, and employing professional pilots for the operation of the aircraft."

Operators of business and corporate aircraft fly under Federal Aviation Regulation Part 91, which regulates all flying that is not for compensation. The majority of NBAA members operate under these rules.

Some 20 percent of NBAA members also operate under FAR Part 135 regulations which is on-demand air charter of aircraft for passenger or cargo operations with allowances for compensation.

Some business aircraft are operated by aircraft management companies, sometimes known as fleet management companies, which operate aircraft for businesses and corporations.

International

IBAC has selected to define its constituency as "that sector of general aviation (as defined by ICAO [International Civil Aviation Organization]) which concerns the operation of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered as not for public hire and piloted by individuals having at the minimum a valid commercial pilot license with an instrument rating."

What is Business Aviation?

Business aviation is a vibrant segment of general aviation. The most recent FAA data show that more than 55,000 general aviation aircraft in the United States are regularly used for business purposes.

Business aviation allows companies to provide quick, safe and reliable transportation whenever and wherever their business needs require.

Business aviation employs all types of aircraft from single-engine, piston-powered airplanes, to the fastest jets and even helicopters to ensure maximum effectiveness.

While most business aircraft operate domestically, 50% of NBAA members use them to expand markets overseas.

Today's business aircraft are quieter, more efficient and safer than ever before, allowing businessmen to work in comfort and privacy between destinations.

Who Uses Business Aircraft?

A New England-based office equipment manufacturer uses a jet on a regularly-scheduled "shuttle" between its facilities. The operation is run like an airline, with "reservations" and "tickets," meeting a transportation need airlines cannot match while saving the company almost a million dollars in travel expenses each year.

A Virginia-based real estate developer uses a helicopter to travel between his office and construction sites to view a property's relationship to its surroundings and to travel to distant meetings, maximizing the use of his time.

A Michigan office furniture manufacturer uses its two jets to whisk prospective customers to its headquarters from all over the U.S. The prospects are picked up in the morning, given a sales presentation on the flight, tour the company's facilities and are back home for dinner.

A hospital management and construction company, based in Tennessee, uses its three jets to transport architects to and from construction sites, fly doctors to lectures and help management keep tabs on the company's operations in 46 states.

A Georgia-based communications executive uses his jet to keep tabs on far-flung newspapers and outdoor advertising concerns. A twin turboprop is used for smaller airports and to help manage properties closer to home.

Other uses of business aircraft include moment's-notice transportation of human organs for transplant and cancer patients for specialized treatments, air ambulance services and overnight delivery of checks and small packages. Clearly, if the modern business aircraft did not exist, it would have to be invented.

Who We Are

Incorporated in 1947, NBAA represents business aviation in the United States and consists of more than 2,900 companies nationwide which own or operate aircraft for use in furthering their business objectives. NBAA members provide transportation services to more than 5,600 American businesses. It is the principal representative of business aviation before Congress and the Federal regulatory agencies such as the FAA, IRS and Customs.

NBAA through its Education and Safety Foundation regularly sponsors a series of seminars on international operations, tax and financial considerations for business aircraft operators, flight department management, and maintenance and operations of various aircraft and components. These educational programs help provide business aviation personnel with the latest information and expertise in this fast-paced field.

NBAA is a major participant in the proceedings of the Radio Technical Commission for Aeronautics (RTCA), the Aeronautical Frequency Committee (AFC), the Air Traffic Procedures Advisory Committee (ATPAC), the FAA's National Airspace Review (NAR), NASA's Aviation Safety Reporting System (ASRS) and, through IBAC, the International Civil Aviation Organization (ICAO).

International Business Aviation Council, Ltd.

The NBAA is a founding member and strong supporter of IBAC, the International Business Aviation Council, Ltd., an organization comprised of national and regional business aviation groups which collectively represent the interests of business aircraft operators in their respective areas of the world.

IBAC Member Organizations

ABAA—Australian Business Aircraft Association

BAUA—Business Aircraft Users Association, Ltd.

CAA/SA—Business Aviation Division of the Commercial Aviation Association of Southern Africa

CBAA—Canadian Business Aircraft Association

EBAA—European Business Aviation Association

GBAA—German Business Aviation Association

NBAA—National Business Aircraft Association, Inc.

SECTION 2
NBAA Statistical Summary

Profile of NBAA Member Companies

The following is a brief summary of facts about the "who," "what" and "where" of the more than 5,600 NBAA member companies and their subsidiaries. It is compiled from surveys of NBAA member companies, by the Wall Street Journal, the Darden Graduate School of Business, the NBAA Salary Survey, NBAA Aviation Data Services and Robert Breiling Associates. It contains information about the size of companies that fly business aircraft, where they are located, the structure of their aviation departments, how often and how long they fly and with what kind of equipment. It describes the people in aviation departments, their career paths and their place in the corporate structure. Because of the format of some of the surveys, some of the totals expressed in percentage add up to more than 100 percent.

The Companies

The median sales figure for NBAA companies is $229 million. Of these, 22.3% have corporate sales of more than $2.5 billion; 26.3% have sales of between $500 million and $2.5 billion; 25% have sales between $100 and $500 million and 26.3% have sales below $100 million.

Fifty-five percent have 1,000 and more employees. Forty-four percent are manufacturing companies, 14% are in finance, insurance or real estate.

Their primary businesses are:

Manufacturing	44%
Finance, Insurance, Real Estate	14%
Business, Professional and Other Services	8%
Mining	7%
Retail Trade	5%
Others	5%
Construction	4%
Transportation/Communications	4%
Wholesale Trade	4%
Public Utilities	3%
Agriculture, Forestry and Fishing	1%
Government	1%

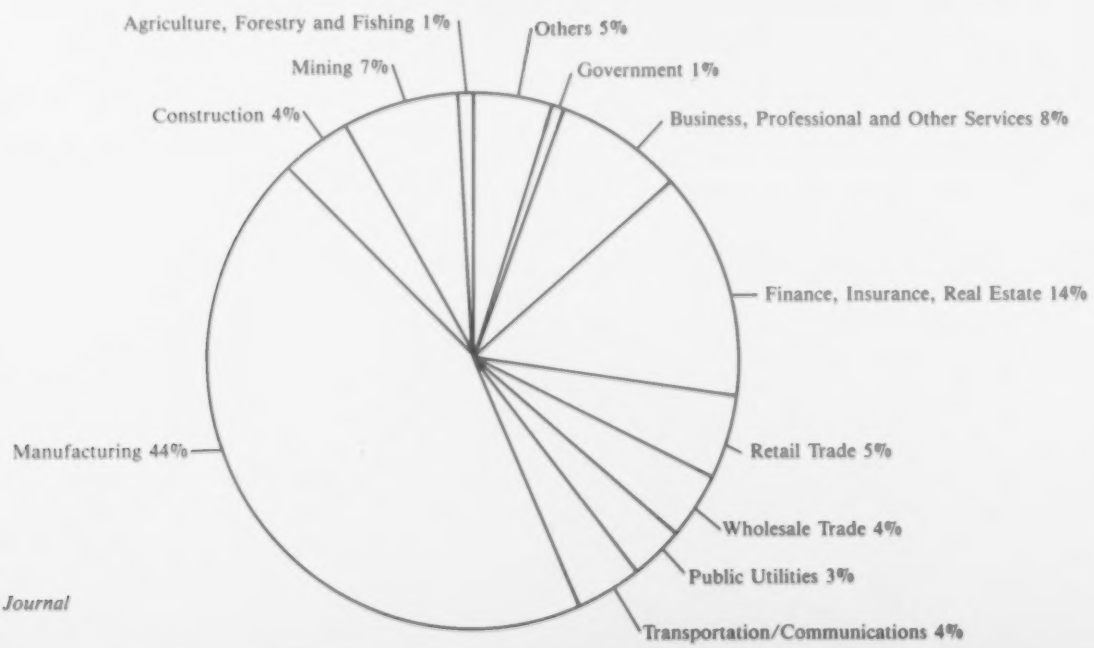
The Equipment

The average number of aircraft operated by NBAA member companies is two. Of these 1.7 are owned, 0.3 are leased.

Turbojets are the most widely used type of aircraft. Fifty-nine percent of NBAA members have turbojets, 50% have turboprops and 21% use multi-engined piston powered aircraft. Eighty-three percent use fixed-wing aircraft exclusively, 13% also use helicopters. Four percent use helicopters exclusively.

NBAA flight departments with more than four aircraft represent 12.4% of the total; three to four aircraft, 18.5%; two aircraft, 23.5% and one aircraft, 45.5%

GRAPH 2-1
Business Aircraft Companies—Composition



Source: Wall Street Journal

Utilization

The median number of flights per month is 26, median stage length is 360 miles with an elapsed time of one and one-half hours.

Passengers

Passengers are mainly top and middle management. Median number of passengers carried is four. Average number of international round trips is seven per year.

Missions

Their primary mission is CEO travel at 56.5%; senior executive travel at 44.5%; customer support, 29.1%; and freight and parts delivery, 5.1%.

Other missions include construction crew travel, product demonstration, charter, government contracting, intercompany mail, interplant shuttle, oil exploration, pipeline/powerline patrol, public relations, employee/VIP travel.

Personnel

The median number of pilots is 2.8 per flight department. Median number of maintenance personnel is 1.2. 10.6% of NBAA aviation departments have more than 20 people; 14.1% have between 11 and 20 people; 23.4% have between 5 and 10 people; 23.5% have 3 to 4 people and 28.5% have 1 to 2 people.

Of those departments that employ women, 5.2% are aviation department managers; 2.2% are chief pilots; 19.1% are captains; 44.9% are copilots, 39% are flight attendants and 8.1% are in maintenance.

Reporting Structure

Forty-nine point four percent of aviation departments report directly to the CEO; 50.6% to some other company officer. Sixty-four percent have one reporting level between the aviation department and the CEO.

Pilot Experience

Previous piloting experience of those piloting corporate aircraft: corporate operation, 89.5%; charter operation, 75.1%; commercial airlines, 30.6%; military, 58.4%.

TABLE 2-1
Pilot Flight Hours Prior To Employment

5,000 or more	5.8%
4,000-4,999	2.9%
3,000-3,999	15.5%
2,500-2,999	13.6%
2,000-2,499	11.1%
1,500-1,999	19.1%
1,000-1,499	9.3%
under 1,000	2.8%

Where Located

Concentration of NBAA member companies follows much the same pattern as the concentration of population centers in the United States with one exception. A disproportionate number of members are based in large states, especially in the West, where distances between markets are greater and air travel is most efficient. Designated areas below include all members within a fifty mile radius from downtown. The top twenty are as follows:

TABLE 2-2
Top Twenty NBAA Bases of Operation

New York City/New Jersey (includes Teterboro, White Plains, Newark)	5.0%
Los Angeles (includes Long Beach, San Bernardino)	3.5%
Dallas (includes Ft. Worth)	3.4%
Houston	2.2%
District of Columbia (includes Baltimore)	2.2%
Miami	2.1%
Atlanta	2.0%
Chicago (includes Elkhart & Waukegan)	1.8%
San Francisco (includes Oakland)	1.6%
Denver	1.5%
Cleveland (includes Akron)	1.5%
Minneapolis/St. Paul	1.4%
St. Louis	1.2%
Detroit (includes Toledo)	1.2%
Wichita	1.2%
Boston	1.1%
Philadelphia	1.0%
San Antonio	1.0%
Richmond	1.0%
Columbus	1.0%

TABLE 2-3
NBAA Member Fleet Composition

Jet Aircraft 30,000 lbs. & over	537
Jet Aircraft under 30,000 lbs.	1,632
Turboprop 12,500 lbs. & over	480
Helicopters 12,500 lbs. & over	20
Turboprop under 12,500 lbs.	634
Helicopters under 12,500 lbs.	683
Recip. Multi-engine 9,000 lbs. & over	2
Recip. Multi-engine between 6,000 lbs. & 9,000 lbs.	246
Recip. Multi-engine 6,000 lbs. & under	326
Single Engine	397
Total	4,957

The fleet of aircraft owned and operated by NBAA members represents a cross section of all sizes and types of aircraft. Total aircraft peaked in 1982 at 5,444. Factors contributing to the decline since then include a cutback in the oil industry, historically one of the major users of business aircraft, and an unprecedented number of industrial mergers.

TABLE 2-4
NBAA Member Fleet—Historical

Fiscal Year	Quantity
1975	2,435
1976	2,773
1977	3,252
1978	3,752
1979	4,043
1980	4,512
1981	5,026
1982	5,444
1983	5,104
1984	5,387
1985	5,547
1986	5,461
1987	5,111
1988	4,957

TABLE 2-5
NBAA Aircraft Noise Compliance

Stage 1	1%
Stage 2	35%
Stage 3	64%

Ninety-nine percent of NBAA members aircraft are designed to meet the quieter noise standards of FAR 36, Stage II and Stage III.

TABLE 2-6
NBAA Annual Meeting & Convention Schedule

1988 Oct. 18-20, Dallas
1989 Oct. 3-5, Atlanta
1990 Oct. 3-5, New Orleans
1991 Oct. 29-31, Houston
1992 Sept. 22-24, Dallas
1993 Sept. 21-23, Atlanta
1994 Oct. 4-6, New Orleans

TABLE 2-7
NBAA Annual Meeting—Attendance

Year	City	Attendance
1975	New Orleans	4,871
1976	Denver	5,382
1977	Houston	7,102
1978	St. Louis	8,226
1979	Atlanta	9,896
1980	Kansas City	10,123
1981	Anaheim	11,658
1982	St. Louis	10,892
1983	Dallas	14,753
1984	Atlanta	12,777
1985	New Orleans	12,677
1986	Anaheim	13,906
1987	New Orleans	13,387

Growth of the NBAA Annual Meeting and Convention reflects the growth of business aviation. The NBAA convention graduated from hotel basements to convention halls in 1971. A minimum of 400,000 gross square feet of exhibit space is now required to house the exhibits. When combined with its static display of aircraft at airports, it is the 27th largest exposition in the country when measured by net square footage of exhibit space. Its cost benefit to exhibitors is one of the best in aviation.

TABLE 2-8
NBAA Member Companies-Composition

Affiliate	31
Associate	1,002
Business	829
Corporate	1,117
Total	2,979
Subsidiaries	2,688
Total Companies Represented by NBAA	5,667
June 30, 1988	

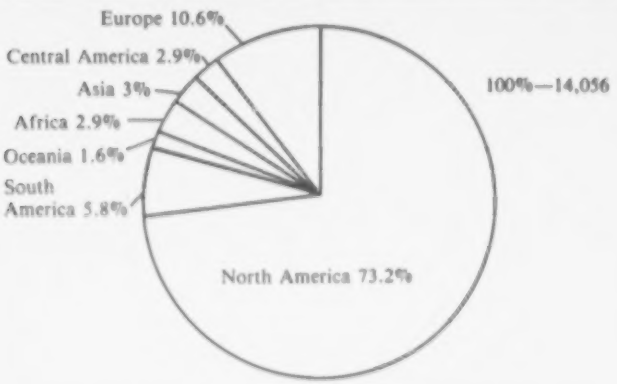
With a few minor exceptions NBAA membership has shown a steady, long-term rise as both business aviation and the NBAA have thrived.

TABLE 2-9
NBAA Member Companies—Historical

Fiscal Year	Members
1975	1,212
1976	1,349
1977	1,510
1978	1,712
1979	1,972
1980	2,217
1981	2,466
1982	2,656
1983	2,638
1984	2,835
1985	2,941
1986	2,902
1987	2,862
1988	2,979

SECTION 3
Industry Statistics

GRAPH 3-1
World fleet shares by region on April 30, 1988



A recent study commissioned by *Interavia* from AvData, based in Wichita, Kansas, shows that the total number of business aircraft in service around the world on April 30, 1988, was 1.7 percent higher than the equivalent figure for 1987.

TABLE 3-1
World Business Aircraft Fleet

World business aircraft fleet on April 30, 1988
(Figures for April 30, 1987, in brackets)

Region	Jets	Turboprops	Total
Africa	154 (142)	251 (238)	405 (380)
Asia	222 (224)	197 (186)	419 (410)
Central America	215 (196)	197 (184)	412 (380)
Europe	682 (589)	812 (700)	1,494 (1,289)
North America	4,669 (4,647)	5,613 (5,799)	10,282 (10,446)
Oceania	82 (69)	148 (121)	230 (190)
South America	234 (197)	580 (527)	814 (724)
Total	6,258 (6,064)	7,798 (7,755)	14,056 (13,819)

(Source: AvData, Wichita)

TABLE 3-2
Worldwide Shipments of New Aircraft by Manufacturer

	Calendar Years		
	1987	1986	1985
Aerospatiale	64	105	48
Beech	314	304	288
British Aerospace	100	91	85
Britten-Norman	29	8	17
Canadair	13	17	9
Cessna	187	546	859
Dassault	49	25	23
De Havilland	30	46	41
Embraer	146	110	141
Fairchild	39	37	35
Gulfstream	30	24	53
Israel	5	16	14
Lake	23	26	23
Learjet	16	20	22
Maule Air	54	65	88
Mooney	143	142	89
Piper	282	326	498
Short	15	26	21
TOTAL	1,539	1,934	2,365

The worldwide shipment of new general aviation aircraft as reported in the *Weekly of Business Aviation* has been slow over the past few years, but the sale and shipment of used aircraft has remained high. In 1987 alone there were 818 used jet aircraft sold.

GRAPH 3-2
Size of General Aviation Market = $15.02 billion, 1986

The size of the general aviation marketplace is $15 billion U.S. Currently, used aircraft sales outreach new aircraft sales. Since most business flights are non-revenue flights, they do not show up as a factor in this graph.

TABLE 3-3
1986 Fortune Industrial 500
Composite Comparison

	Aircraft Operators	Non-Operators		Aircraft Operators	Non-Operators
Companies	336	164	Net Income as Percent of Stockholders Equity	10.2	8.6
Employees	11,800,000	1,580,000	Sales Per Employee	131,000	112,500
Sales (×1,000)	1,555,000,000	177,000,000	Assets Per Employee	120,800	86,500
Assets (×1,000)	1,400,000,000	136,000,000	Net Income Per Employee	5,100	2,900
Net Income (×1,000)	60,400,000	4,580,000	Total Aircraft	1,400	(turbine, fixed and rotary wing)
Stockholders Equity (×1,000)	591,800,000	53,550,000			
Net Income as Percent of Sales	3.9	2.6			

Source: AvData, Wichita

It is no accident that year after year the companies that operate aircraft in the Fortune Industrial 500 out perform those that do not operate aircraft by wide margins in sales, assets, employees and financially.

SECTION 4
Operational Statistics

TABLE 4-1
General Aviation Miles Flown By Aircraft Type and Primary Use in US Nautical Miles (×1,000)

Aircraft Type	Corporate	Business	Personal	Commuter	Air Charter	Other	Total
Fixed Wing							
Piston	141,629	695,508	1,009,468	92,255	222,235	703,618	286,471
Turboprop	194,299	38,228	7,576	253,137	40,870	16,050	550,215
Turbojet	497,436	39,578	4,577	160	82,323	49,634	673,709
Fixed Wing Total	833,364	773,368	1,021,622	34,552	345,428	769,304	4,088,638
Rotorcraft	38,499	9,057	2,417	6,042	35,804	88,959	175,779
Other	6	14	10,469	0	0	2,124	12,613
Total	871,869	782,439	1,034,508	351,595	381,232	855,391	4,277,031

The combination of corporate and business aircraft, the category that is by far the most productive in actual miles flown compared to all other categories.

TABLE 4-2
General Aviation Total Hours Flown By Aircraft Type and Primary Use, 1986 in US

Aircraft Type	Corporate	Business	Personal	Commuter	Air Charter	Other	Total
1 Engine Piston Total Hours	360,376	3,982,141	9,142,198	294,599	708,644	7,450,681	21,938,632
2 Engine Piston Total Hours	8,145,959	1,546,503	581,535	419,871	999,243	548,958	4,911,071
Piston Total Hours	1,175,335	5,528,645	9,725,260	719,718	1,707,887	8,054,009	26,860,848
Turboprop Total Hours	1,021,660	169,492	39,398	1,332,308	203,967	114,711	2,881,537
Turbojet Total Hours	1,227,280	97,678	11,405	381	198,364	119,201	1,654,308
Fixed Wing Total Hours	3,424,275	5,795,816	9,776,062	2,052,407	2,110,217	8,237,925	31,396,696
Rotorcraft Total Hours	356,111	98,755	38,232	132,944	803,141	1,196,211	2,625,395
Total Tot. Hours	3,780,810	5,895,529	10,097,112	2,185,351	2,913,358	8,998,192	34,416,352

Note: Column summations may differ from printed totals due to estimation procedures.
Row summations may differ from printed totals because some active aircraft did not report use.

TABLE 4-3
General Aviation Aircraft By Aircraft Type and Primary Use, 1986 in US

Aircraft Types in Active Use	Corporate	Business	Personal	Commuter Carrier	Air Charter	Other	Total Active
1 Engine Piston Total	1,773	32,920	107,967	389	2,215	26,511	171,777
2 Engine Piston Total	3,069	9,111	5,864	430	2,930	2,305	23,721
Piston Total	4,842	42,030	113,844	826	5,145	28,944	195,646
Turboprop Total	3,094	819	135	795	532	590	5,984
Turbojet Total	3,119	270	252	3	510	326	4,480
Fixed Wing Total	11,055	43,119	114,231	1,624	6,187	29,860	206,090
Rotorcraft Total	1,010	644	713	97	1,381	3,099	6,943
Total Number of Active Aircraft	12,075	43,780	120,308	1,721	7,568	34,577	220,044

Note: Column summations may differ from printed totals due to estimation procedures.
Row summations may differ from printed totals because some active aircraft did not report use.

The FAA in its annual survey shows 220,044 active general aviation aircraft. This is ten thousand more aircraft than the 1980 listing.

TABLE 4-4
Hours Flown by Business Aircraft in US—Historical

Calendar Year	Hours (000)
1975	9,500
1976	10,100
1977	10,300
1978	12,800
1979	13,000
1980	13,700
1981	14,300
1982	11,800
1983	11,200
1984	11,400
1985	10,700
1986	9,700
1987	9,600

TABLE 4-5
Business Aircraft Inventory in US—Historical

Calendar Year	Quantity
1975	45,000
1976	48,000
1977	50,000
1978	55,000
1979	63,000
1980	64,200
1981	66,300
1982	63,600
1983	62,000
1984	63,700
1985	59,100
1986	55,800

TABLE 4-6

US Airport Picture—1986

Top 30 FAA-Operated Airport Traffic Control Towers
by order of total airport operations.

Tower	Rank	Number
Chicago O'Hare	1	794,772
Atlanta	2	774,755
Dallas/Ft. Worth Regional	3	575,214
Los Angeles	4	565,258
Santa Ana	5	540,122
Denver Stapleton	6	520,667
Van Nuys	7	472,428
St. Louis	8	460,458
San Francisco	9	422,663
Boston Logan	10	420,124
Newark	11	413,664
Phoenix Sky Harbor	12	412,312
Detroit Metro/Wayne Co.	13	405,935
Minneapolis/St. Paul	14	401,791
Seattle Boeing	15	400,645
Long Beach	16	397,185
Memphis	17	380,278
Oakland	18	370,928
Philadelphia	19	368,179
Pittsburgh	20	365,624
New York La Guardia	21	365,249
Pontiac	22	364,322
Honolulu	23	363,895
Denver Centennial	24	363,626
Charlotte	25	361,217
Las Vegas	26	352,225
San Jose	27	348,775
Miami	28	345,296
New York John F. Kennedy	29	326,552
Washington National	30	352,731

It may come as a surprise to many who are not involved with general aviation airports that Santa Ana and Van Nuys are in the top seven in the number of operations.

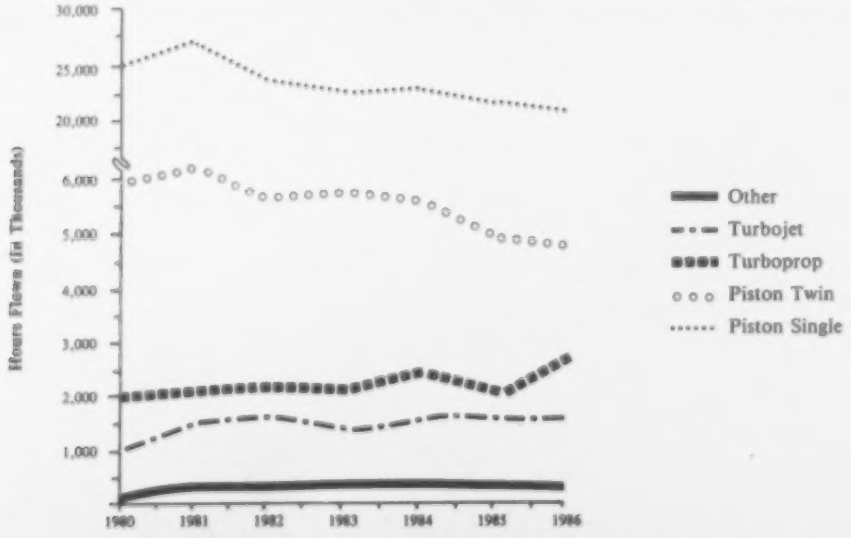
TABLE 4-7
Business Aircraft Utilization

Aircraft Type	Average Load Factor (1988)	Average Stage Length (1988)	Hours Flown Per Year (1988)
Gulfstream G-II/-III/IV	5.80	953	534
Canadaire Challenger 600/601	3.67	677	499
Lockheed JetStar	4.16	556	429
Falcon 50	5.03	688	551
Rockwell Sabreliner	2.60	478	331
BAe-HS-125-600/700/800	3.87	554	492
Falcon 20/200	4.58	532	455
Lear jet 55	3.56	457	535
Cessna Citation III	3.06	515	522
IAI Westwind I/II	3.25	570	463
Lear jet 30 Series	3.46	607	430
Falcon 10/100	3.04	526	475
Cessna Citation I/II	3.47	345	457
Heavy Turboprops (All)	6.55	256	495
Beech King Air 200/300	3.41	348	387
Beech King Air 90/100	4.05	313	450
Piper Cheyennes (All)	2.98	288	368
Cabin Class Piston Twins	1.70	176	303
Turbine Helicopters	2.60	56	499

Source: Business and Commercial Aviation Magazine

"Higher utilization" are two watchwords in business aviation. Many operators, as indicated here, are averaging more than 500 hours for jet aircraft. More utilization goes a long way toward making an aircraft and aircraft operations more attractive on a company's balance sheet. NBAA member company aircraft fly significantly more hours per year per aircraft than do those of non-member aircraft operators.

GRAPH 4-1
Hours Flown by Type of Aircraft



Although cumulative general aviation hours flown are down slightly, the hours flown by turbojet and turboprop aircraft, the aircraft most associated with business aviation are either staying the same or improving.

TABLE 4-8
General Aviation Aircraft Fuel Consumption
(Millions of Gallons)

Fiscal Year	Fixed Wing				Rotocraft			
	Piston		Turboprop	Turbojet	Piston			
	Single Engine	Multi-Engine				Turbine	Other	Total
1983	235.1	189.3	230.9	396.2	7.8	54.2	0.4	1,113.9
1984	247.8	196.3	236.4	408.0	8.5	62.9	0.2	1,161.1
1985	249.4	178.4	210.2	433.2	8.7	58.9	0.1	1,138.9
1986	242.0	157.8	230.0	451.4	11.0	56.7	0.1	1,149.0
1987E	239.8	157.8	230.0	477.9	11.0	59.8	0.1	1,176.4
Forecast								
1988	237.6	154.6	238.6	504.5	11.0	59.8	0.1	1,206.2
1989	237.6	151.3	238.6	504.5	9.7	63.0	0.1	1,204.8
1990	236.5	151.3	238.6	531.0	9.7	69.3	0.1	1,236.5

Fuel consumption for general aviation aircraft has been up modestly over the past few years reflecting a moderate increase in activity.

TABLE 4-9
NBAA 1987 Safety Awards Summary 1984–1987

Awards	Number	Time in Hours & Years
Corporate Operations	839	13,290,640 Hours
Commercial Operations	58	480 Years
Maintenance Departments	333	
Pilots	5,290	30,290,640 Hours
Maintenance Technicians	2,300	29,672 Years

NBAA member companies, pilots, and maintenance departments have established an enviable record in safety as evidenced by the above Safety Award Summary. The hours flown by the Program's participating pilots (computed at a conservative 250 knots) equals 7-1/2 billion accident free nautical miles—*or the equivalent of 192 times around the earth's equator without an accident each day*. The NBAA Safety Award Program is sanctioned by the National Safety Council.

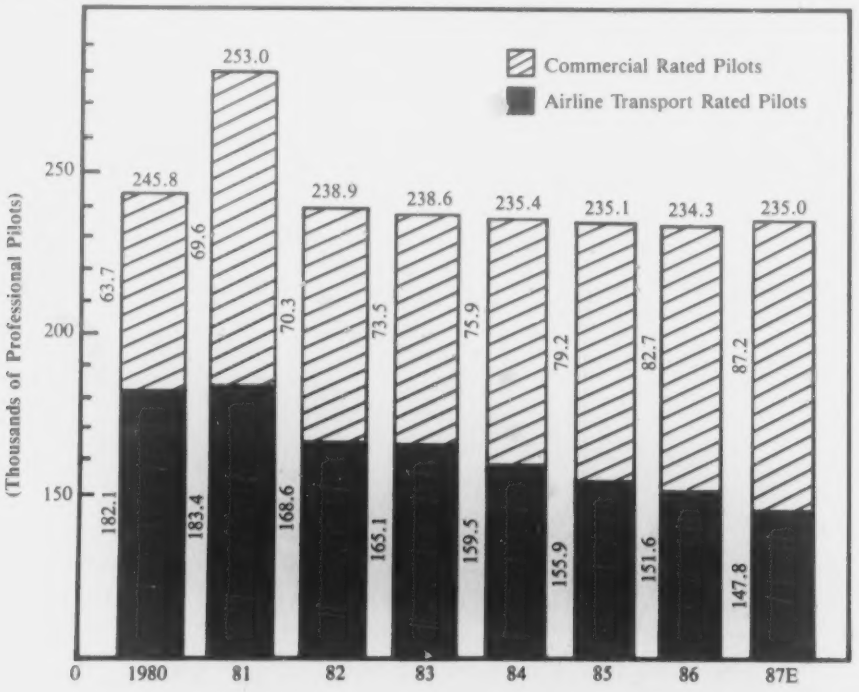
In 1984 NBAA revamped its Flying Safety Awards Program based essentially on the number of safe hours flown by an organization's flight department and individual pilots. It also included the number of years put in by maintenance personnel who greatly contribute to safety.

TABLE 4-10
Total Air Traffic Activity at FAA Airport Traffic Control Towers (×1,000) By Aviation Category—Fiscal Years 1982–1986

	Total		Air Carrier		General Aviation		Military	
Year	Total	Annual Change %	Total	Annual Change %	Total	Annual Change %	Total	Annual Change %
1986	58,956	+2	12,300	+9	44,016	−1	2,639	+4
1985	57,937	+2	11,281	+4	44,107	+1	2,548	+4
1984	56,958	+7	10,879	+12	43,629	+5	2,450	−1
1983	53,320	+5	9,673	+7	41,182	+5	2,464	+5
1982	50,634		9,049		39,236		2,349	

General aviation is very much a predominant force in the nations airways, far outstripping the total of both air carriers and military aircraft.

GRAPH 4-2
US Professional Pilot Population



Source: FAA Forecast 1988

The trend on the graph above indicates approximately 7% reduction in aircrew reserves from the 1981 peak. During the same period the airlines have hired an estimated (by FAPA) 10,000 pilots per year. No numbers are available specifically for business aviation but the trends bear watching.

TABLE 4-11
Safety Statistics and Hours Flown (×1,000)

Corporate Aircraft

Year	Turbojets				Turboprop				Other Aircraft Accidents	Accidents 100,000 hrs.
	Total Hrs Flown	Accidents	Fatal	Fatalities	Accidents	Fatal	Fatalities	Single Pilot		
1987	3,780	2	1	2	3	1	8	1	9	.47
1986	4,150	6	2	9	13	5	21	8	0	.46
1985	4,175	9	3	5	14	3	4	8	14	.89
1984	5,230	8	0	0	10	2	5	8	0	.25
1983	5,180	7	3	11	11	3	12	9	8	.50
1982	N/A	3	0	0	12	2	13	10	N/A	N/A
1981	N/A	9	3	6	23	9	26	14	N/A	N/A
1980	N/A	7	1	2	23	7	32	20	N/A	N/A

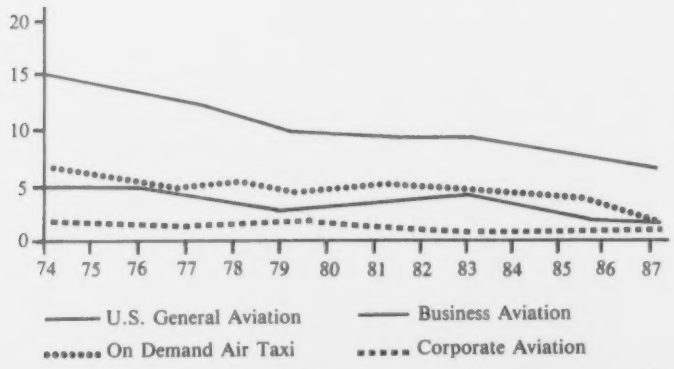
Business Aircraft

	Turbojet				Turboprop				Other Aircraft Accidents	Accidents 100,000 hrs.	GA Accidents 100,000 hrs.
	Total Hrs Flown	Accidents	Fatal	Fatalities	Accidents	Fatal	Fatalities	Single Pilot			
1987	5,900	9	4	10	25	9	22	19	158	3.25	8.31
1986	6,480	10	1	4	15	6	17	13	158	2.82	8.80
1985	6,533	10	4	12	13	7	17	8	234	3.93	8.56
1984	6,050	11	6	20	19	5	12	17	233	4.34	9.56
1983	7,220	7	2	4	9	5	12	7	287	4.19	9.86
1982	N/A	7	2	7	16	4	17	4	N/A	N/A	10.07
1981	N/A	6	2	3	17	6	26	15	N/A	N/A	9.51
1980	N/A	10	4	9	11	4	11	10	N/A	N/A	9.86

Sources: Robert Breiling Associates (1987 estimates.)

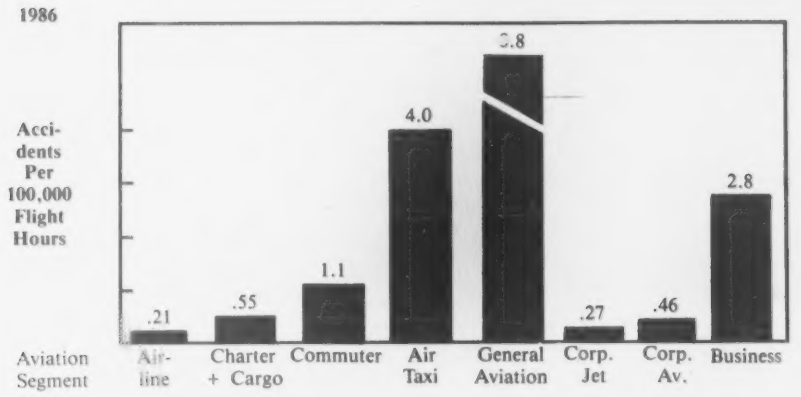
These accident statistics show an excellent safety record especially for corporate aircraft. They also show that most aircraft accidents happen with single pilot operations.

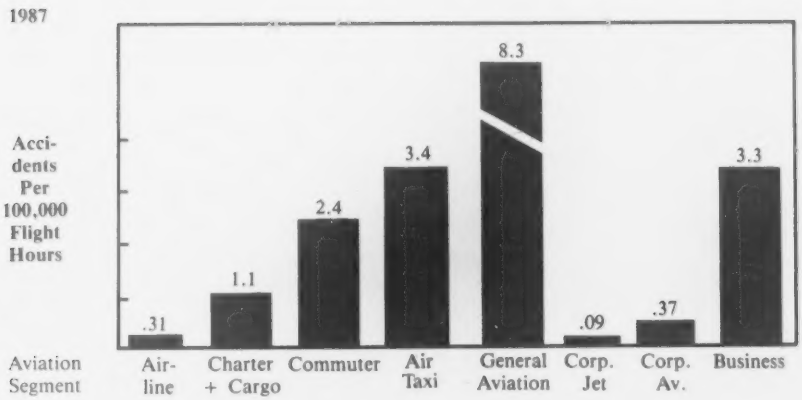
GRAPH 4-3
Accident Rates
(Per 100,000 Hours Flown)
1974–1987



The accident rate for all of general aviation aircraft has been reduced dramatically in the past 13 years with corporate operations leading the way.

GRAPH 4-5
A Closer Analysis of Safety Statistics





Corporate aviation consistently has the best accident rate record among all general aviation aircraft and closely rivals that of the airlines.

Sources: Robert Breiling Associates

GRAPH 4-6
Membership Count
NBAA Members by State

This map shows the location of 2990 NBAA member companies as of September 1, 1988. In addition, there are 90 members located in 21 countries outside the United States.

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Business Aviation
1990 FACT BOOK

NATIONAL
BUSINESS AIRCRAFT
ASSOCIATION, INC.

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Statistical totals in the following pages will vary because of the differences in data sources, differences in time frames and differences in source definitions. The components of general aviation, of which business aviation is but one, are not always defined in the same way by every aviation source.

SECTION 1

Business Aviation and NBAA

What Is Business Aviation?

Business Aviation is a vibrant segment of general aviation. Federal Aviation Administration (FAA) data show that more than 50,000 general aviation aircraft in the United States are regularly used for business purposes.

Business aviation allows companies to provide quick, safe and reliable transportation whenever and wherever business needs require it.

Business aviation operators use all types of aircraft from single and twin engine, piston-powered airplanes, helicopters, turboprops to the fastest jets to ensure maximum effectiveness.

While most business aircraft operate domestically, 50% of NBAA members use them to expand markets overseas.

Today's business aircraft are quieter, more efficient and safer than ever before, allowing businessmen to work in comfort and privacy between destinations.

The business aircraft, much like the computer, is a business tool that gives a businessman/woman more time and flexibility to do his/her job.

Business Aviation—FAA Definition

The FAA describes *business transportation* as "use of an aircraft by a corporation not for compensation or hire by individuals for the purposes of transportation required by the business in which they are engaged."

Corporate transportation as described by the FAA is "any use of an aircraft by a corporation, company, or other organization for the purposes of transporting its employees and/or property not for compensation or hire, and employing professional pilots for the operation of the aircraft."

What Is NBAA?

Incorporated in 1947, NBAA represents business aviation in the United States and consists of more than 3,000 companies and another 3,500 subsidiaries and affiliates of these companies worldwide which own or operate aircraft for the purpose of providing transportation to advance their business objectives. NBAA members provide transportation services to more than 6,000 American businesses.

NBAA is the principal representative of business aviation before Congress, the Administration and its federal regulatory agencies such as FAA, IRS, FCC and Customs. It is a major participant on behalf of business aviation in proceedings of the Radio Technical Commission for Aeronautics (RTCA), the Aeronautical Frequency Committee (AFC), the Air Traffic Procedures Advisory Committee (ATPAC), the International Civil Aviation Organization (ICAO) and other international forums through its participation in the International Business Aviation Council, Ltd.

When necessary, NBAA engages in court cases on behalf of business aviation, especially in noise and would-be business aircraft access-limiting litigation.

NBAA *business members* are defined as "any commercial or industrial enterprise (corporation, company, partnership, financial institution, proprietorship or individual) which is engaged in business, commerce, trade or industry and which owns or operates United States registered aircraft as an aid to the conduct of its business, not for hire, flown by pilots having at least a commercial license and a currently valid instrument rating."

NBAA describes its *corporate members* along the same lines as the FAA but is more detailed: "any commercial or industrial enterprise (corporation, company, partnership, financial institution, proprietorship or individual) which is engaged in business, commerce, trade or industry, and which owns or operates United States registered aircraft, not for hire, flown by pilots having current professional qualifications, as an aid to the conduct of its business."

NBAA corporate members must have at least one multi-engine aircraft, employ an operations manual and a maintenance program, must use two professional pilots when passengers are aboard with at least one of those pilots having a current air transport rating and the other at least a current commercial license and instrument rating.

Oversimplified, "business" flyers most often are those that fly their own aircraft while "corporate" flyers are generally those who sit in the passenger cabin while their aircraft is flown by professional pilots.

The term "business" aircraft is generic and refers to both business and corporate operators of these aircraft. Sometimes business aircraft are referred to as corporate aircraft. The terms "business" and "corporate" aircraft are interchangeable although "corporate" is usually reserved for jets.

Both business and corporate operators fly under Federal Aviation Regulation (FAR) Part 91, which regulates all flying that is not for compensation. The majority of NBAA members operate under these rules.

Some 20 percent of NBAA members also operate under FAR Part 135 regulations which covers on-demand, air charter of aircraft for

passenger or cargo operations *with* allowances for compensation.

A growing number of business aircraft are operated by aircraft management companies, sometimes known as fleet management companies, which operate aircraft for one or more businesses or corporations.

NBAA maintains an "associate" category of membership which consists of those directly involved with sales and services to business aircraft operators. Some of these associate members operate their own aircraft.

Business aircraft operators from countries other than the United States may join NBAA through its special "affiliate" category. (A complete tally of NBAA membership categories is found in TABLE 2-5.)

NBAA is well-known, perhaps best known, for its Annual Meeting and Convention which is the largest exhibition of commercial aviation products and services in the world.

NBAA regularly sponsors a series of seminars on international operations, maintenance management and other educational programs to help provide business aviation personnel with the latest information and expertise in this fast-paced field.

International

Much of NBAA international activity is pursued through its affiliation with the International Business Aviation Council, Ltd. (IBAC), an organization comprised of national and regional business aviation groups which collectively represent the interests of business aircraft operators in their respective areas of the world. IBAC member organizations follow:

ABAA—Australian Business Aircraft Association
BAUA—Business Aircraft Users Association, Ltd (United Kingdom)
CAA/SA—Business Aviation Division of the Commercial Aviation Association of Southern Africa
CBAA—Canadian Business Aircraft Association
EBAA—European Business Aviation Association
GBAA—German Business Aviation Association
NBAA—National Business Aircraft Association

Who Uses Business Aircraft?

A New England-based office equipment manufacturer uses a jet on a regularly-scheduled "shuttle" between its facilities. The operation is run like an airline, with "reservations" and "tickets," meeting a transportation need airlines cannot match while saving the company almost a million dollars in travel expenses each year.

A Virginia-based real estate developer uses a helicopter to travel between his office and construction sites to view a property's relationship to its surroundings and to travel to meetings, maximizing the use of his time.

A Michigan office furniture manufacturer uses its two jets to whisk prospective customers to its headquarters from all over the country. The prospects are picked up in the morning, given a sales presentation on the flight, tour the company's facilities and are back home for dinner.

A hospital management and construction company, based in Tennessee, uses its three jets to transport architects to and from construction sites, fly doctors to lectures and help management keep tabs on the company's operations in 46 states.

A Georgia-based communications executive uses his jet to keep in touch with his far-flung newspapers and outdoor advertising concerns. A twin turboprop is used for smaller airports and to help manage properties closer to home.

Other uses of business aircraft include moment's notice transportation of human organs for transplant and cancer patients for specialized treatments, air ambulance services and overnight delivery of checks and small packages. Clearly, if modern business aircraft did not exist, it would have to be invented.

SECTION 2

NBAA Statistical Summary

Profile of NBAA Member Companies

The following is a brief summary of facts about the "who," "what" and "where" of the more than 6,000 NBAA member companies and their subsidiaries. It is compiled from surveys of NBAA member companies, *Wall Street Journal* surveys, the Darden Graduate School of Business, the NBAA biennial salary survey, Aviation Data Services and Robert Breiling Associates. It contains information about the size of companies that fly business aircraft, where they are located, the structure of their aviation departments, how often and how long they fly and with what kind of equipment. It describes the people in aviation departments, their career paths and their place in the corporate structure. Because of the format of some of the surveys, some of the totals expressed in percentages add up to more than 100.

The Companies

The median sales figure for NBAA companies according to a 1987 *Wall Street Journal* survey is $229 million. Of these companies, 22.3% have sales of more than $2.5 billion; 26.3% have sales between $500 million and $2.5 billion; 25% have sales between $100 million and $500 million and 26.3% have sales below $100 million.

Fifty-five percent have 1,000 or more employees; 44% are manufacturing companies and 14% are in finance, insurance and real estate. (See circular GRAPH 2-1.)

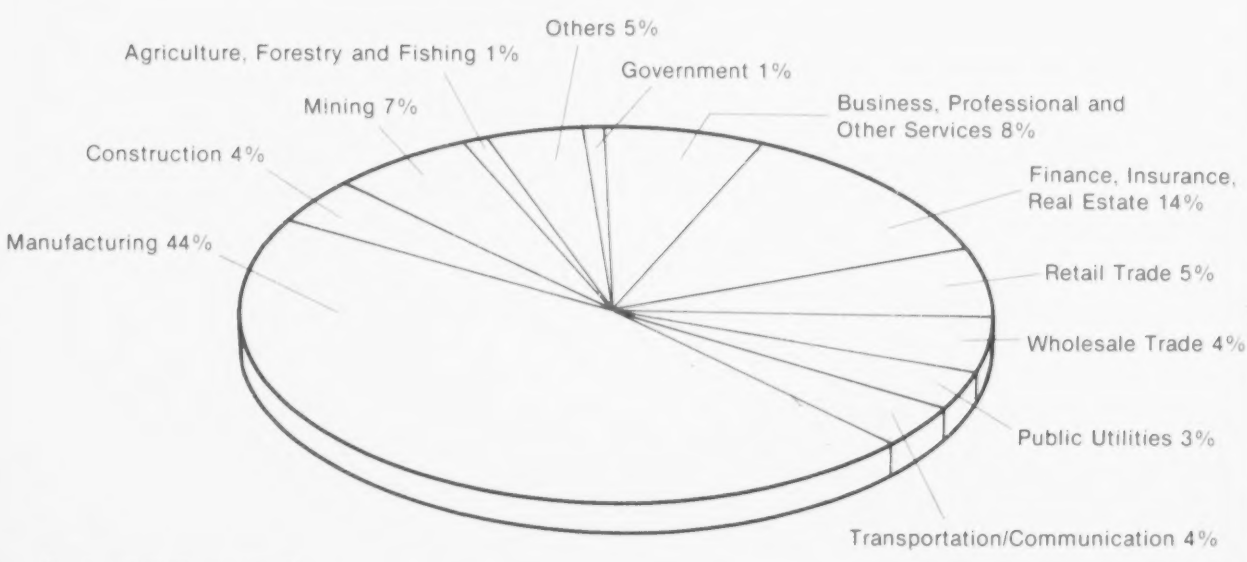
The Equipment

The average number of aircraft operated by NBAA member companies is two. Of these 1.7 are owned, 0.3 are leased.

Turbojets are the most widely used type of aircraft. Fifty-nine percent of NBAA members have turbojets, 50% have turboprops and 21% use multi-engine piston-powered aircraft. Eighty-three percent use fixed-wing aircraft exclusively, 13% also use helicopters. Four percent use helicopters exclusively.

NBAA member flight departments with more than four aircraft represent 12.4% of the total; three to four aircraft,18.5%; two aircraft, 23.5% and one aircraft, 45%.

GRAPH 2-1
Business Aircraft Companies—Composition



Source: Wall Street Journal

Utilization

The median number of flights per month is 26, median stage length is 360 nautical miles with an elapsed time of one and one-half hours. The NBAA member fleet flew over one billion miles in 1989.

Passengers

Passengers are mainly top and middle management. Median number of passengers carried is four. Average number of international round trips is seven per year, per passenger.

Missions

Primary mission is CEO travel at 44.5%; customer support is 29.1% and freight and parts delivery is 5.1%. Other missions include construction crew travel, product demonstration, charter, government contracting, intercompany mail, interplant shuttle, oil exploration, pipeline/powerline patrol, public relations, employee travel.

Personnel

The median number of pilots is 2.8 per flight department. Median number of maintenance personnel is 1.2. Size of departments is as follows:

People	Percent
20 or more	10.6
11-20	14.1
5-10	23.4
3-4	23.5
1-2	28.5

Of those departments that employ women, 5.2% are aviation department managers; 2.2% are chief pilots; 19.1% are captains; 44.9% are copilots; 39% are flight attendants and 8.1% are on maintenance.

In all, there are approximately 8,600 pilots and 3,600 maintenance personnel working for NBAA member companies.

Reporting Structure

Forty-nine point four percent of aviation departments report directly to the CEO; 50.6% to some other company officer. Sixty-four percent have one reporting level between the aviation department and the CEO.

Pilot Experience

Previous piloting experience of those piloting corporate aircraft is: corporate operation, 89.5%; charter operation, 75.1%; commercial airlines, 30.6%; military, 58.4%. About one-fourth had more than 3,000 flight hours when hired. (See TABLE 2-2.)

Where Located

Concentration of NBAA member companies follows much of the same pattern as the concentration of population centers in the United States with one exception. A disproportionate number of members are based in large states especially in the West where distances between markets are greater and air travel is most efficient. Designated areas (TABLE 2-3) include all members within a fifty-mile radius from downtown.

B/CA Turbine Survey

Supplemental information on business aviation flight departments may be gained from the results of a survey printed by *Business and Commercial Aviation* magazine in February 1989 of some 300 aviation departments that operated 807 turbine-powered aircraft—turbojets, turboprops and helicopters. Most of these operators are also NBAA members and deserve to be part of this statistical summary.

Cost Allocation:
26% use time-sharing arrangements.
51% use some sort of chargeback system.

Fuel Farms:
25% do their own fueling at home base.

Budget:
28% fuel.
28% salaries/benefits.
23% maintenance.
8% training.
13% "other."

Training:
71% use simulator school for training.
10% do in-house training.
16% receive training from manufacturer.

Hangar Space:
55% share hangar space with other companies.

Crews:
88% of turbojets use two pilots.
10% of turbojets use three crewmen.
56% of turboprops use two pilot crews.
20% of helicopters use two pilots.
3% use flight attendants always, 11% "sometimes."

Security:
25% have on-board electronic security systems.

Personal Insurance:
83% do *not* have loss-of-license insurance.
88% offer other positions in the company if certificate is lost for medical reasons—30% at same pay.

Age 65:
35% could fly to age 65.
17% required pilots to step down at 60.
37% no policy.

Duration:
7.25 years of employment at one company for pilots.
5.72 years for maintenance personnel.

TABLE 2-1

NBAA Member Company Fleet Composition

There are many sizes and shapes of business aircraft. Selection of aircraft from high-speed, intercontinental jets to hovering helicopters depends upon NBAA member company's mission. In early 1990 the 3,095 member companies listed 5,087 aircraft with NBAA.

Turbojets, 30,000 Pounds and Over **634**

(***Examples:*** Boeing models 707, 727 and 737; British Aerospace model BAC 1-11; Canadair Models 600 and 601; Falcon models 50, 200 and 900; Fokker model 28; Gulfstream models II, III and IV; Lockheed Jetstar, etc.)

Turbojets, Under 30,000 Pounds **1,690**

(***Examples:*** Beechjet model 400; British Aerospace models 125-400, 600,700 and 800; Cessna Citation models 500, 501, 550, 551, 560 and 650; Falcon models 10, 20 and 100; Learjet models 23, 24, 25, 28, 35, 36 and 55; Israel Aircraft Industries models 1121, 1123, 1124 and 1125; Sabreliner models 265, 40, 60, 65, 70, 75 and 80.)

Turboprops, 12,500 Pounds and Over **494**

(***Examples:*** Beechcraft King Air models 200 and 300; Fairchild model 27; Gulfstream model I, and Swearingen models III and IV.)

Turboprops, Under 12,500 Pounds **596**

(***Examples:*** Beechcraft King Air models 90 and 100; Cessna models 425 and 441; Gulfstream models 680, 690, 695, 700, 840 and 980; MU-2 Series; Piper models 31T, 42 and 44.)

Reciprocating Multi-Engine, 9,000 Pounds and Over **4**

(***Example:*** Gulfstream model 73.)

Reciprocating Multi-Engine, Between 6,000 and 9,000 Pounds **230**

(***Examples:*** Beechcraft models 18, 58P, 60, 65 and 80; Cessna models 401, 402, 404, 414 and 421; Gulfstream model 500, Piper model 31.)

Reciprocating Multi-Engine, 6,000 Pounds and Under **295**

(***Examples:*** Beechcraft models 55, 58 and 76; Cessna models 303, 310, 337 and 340; Piper models 23, 30, 34, 46, 600 and 601.)

Reciprocating Single Engine **461**

(***Examples:*** Beechcraft models 35 and 36; Cessna models 152, 172, 182 and 210; Piper models 28 and 32.)

Helicopters, 12,500 Pounds and Over **11**

(***Examples:*** Aerospatiale models 350 and 355; Augusta model 109; Bell models 206, 212 and 222; Sikorsky model 76.)

Total Aircraft Listed with NBAA **5,087**

Most aircraft used by NBAA members are turbojets and most of these weigh less than 30,000 pounds.

Commercial Certificates

Of the 20% of NBAA members that operate under a commercial certificate, 94% are Part 135 operators with 6% listed as "Other." However, those companies with commercial certificates only operate half of their flights under a commercial certificate.

International Flights

Along with an expansion in the size of the international marketplace, it is not surprising that more than 50% of NBAA member companies travel outside the United States each year with most of the traffic going to Canada. In 1987 there were more than 50,000 international flights by NBAA members. (See TABLE 2-4.)

Connection To Air Carriers

Of the flights to airports with commercial air service, 16% are made to deliver passengers to, or pick up passengers from, air carrier flights.

TABLE 2-2

Professional Pilot Experience Flight Hours Prior to Employment at Present NBAA Company

Hours	Percent
3,000 or more	24.2
2,500-2,999	13.6
2,000-2,499	11.1
1,500-1,999	19.1
1,000-1,499	9.3
Under 1,000	2.8

NBAA pilots receive the same level of training and have similar levels of experience as airline pilots.

TABLE 2-3

Top Twenty NBAA Bases of Operation

	% of NBAA Use
1. New York City/New Jersey (includes Teterboro, White Plains, Newark)	5.0%
2. Los Angeles (includes Long Beach, San Bernardino)	3.5%
3. Dallas (includes Ft. Worth)	3.4%
4. Houston	2.2%
5. District of Columbia (includes Baltimore)	2.2%
6. Miami	2.1%
7. Atlanta	2.0%
8. Chicago (includes Elkhart & Waukegan)	1.8%
9. San Francisco (includes Oakland)	1.6%
10. Denver	1.5%
11. Cleveland (includes Akron)	1.5%
12. Minneapolis/St. Paul	1.4%
13. St. Louis	1.2%
14. Detroit (includes Toledo)	1.2%
15. Wichita	1.2%
16. Boston	1.1%
17. Philadelphia	1.0%
18. San Antonio	1.0%
19. Richmond	1.0%
20. Columbus	1.0%

NBAA member aircraft are based near corporate headquarters in the largest cities. This table includes aircraft based within fifty miles of the metropolitan areas mentioned. For a complete summary of NBAA member locations by state, see the map titled GRAPH 4-9 Membership Count—NBAA Members by State.

TABLE 2-4

International Flight Distribution

Region	Percent
Canada	18.0
Europe	15.6
Mexico	15.4
Caribbean	15.2
South America	9.5
Mideast	8.9
Africa	8.8
Pacific	8.6

NBAA expects growth internationally, especially in Europe and the Pacific Rim.

TABLE 2-5

NBAA Member Companies—Composition

Affiliate	32
Associate	1,076
Business	851
Corporate	1,125
Total	**3,084**
Subsidiaries	3,487
Total Represented by NBAA	**6,571**

March 31, 1990

With a few minor exceptions through the years, NBAA membership has shown a steady, long-term rise as both business aviation and NBAA have flourished. For a detailed description of each membership category, please refer to Section 1, "What Is NBAA?"

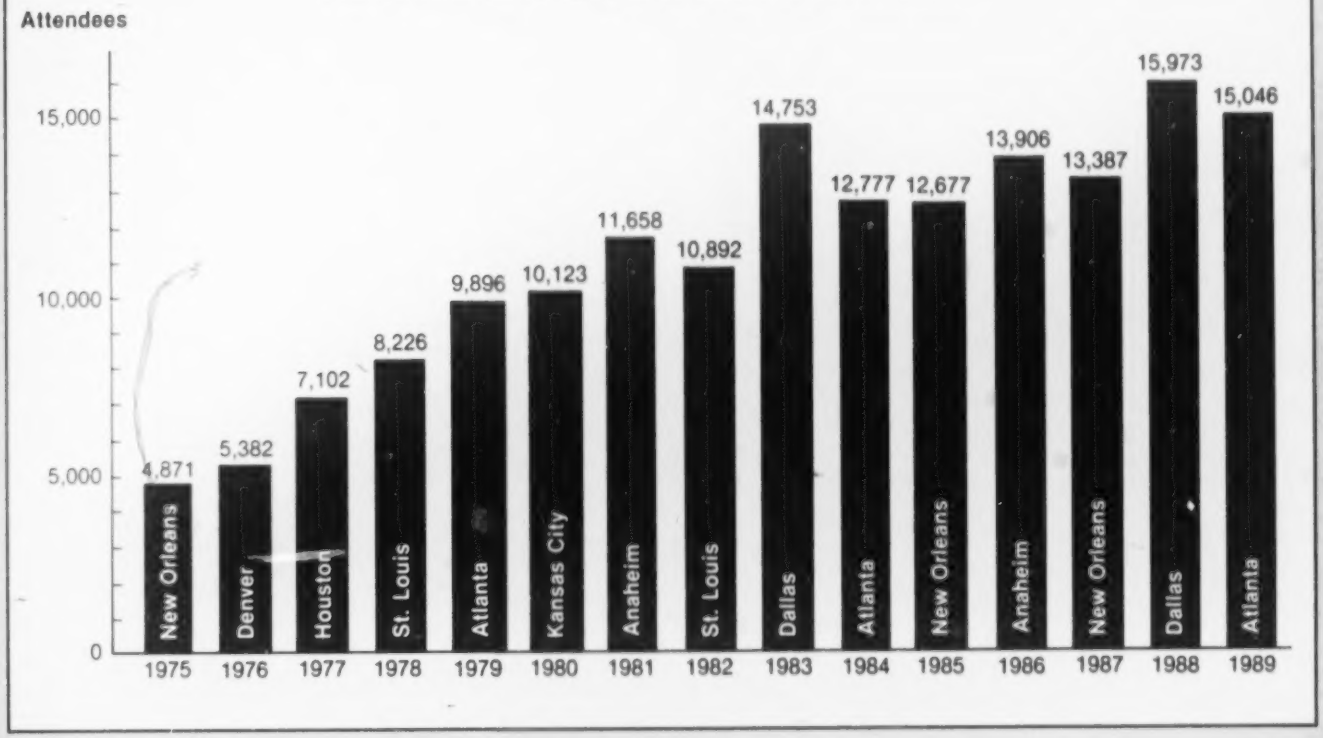
TABLE 2-6

NBAA Annual Meeting and Convention Schedule

Date	Place
1990 October 3-5	New Orleans
1991 October 29-31	Houston
1992 September 22-24	Dallas
1993 September 21-23	Atlanta
1994 October 4-6	New Orleans

NBAA convention sites are limited to a few cities that can accommodate the large exhibit area and hotel room requirements of this ever-expanding display of commercial aviation products and services.

GRAPH 2-2
NBAA Annual Meeting and Convention Attendance



GRAPH 2-3
NBAA Member Companies and Fleet

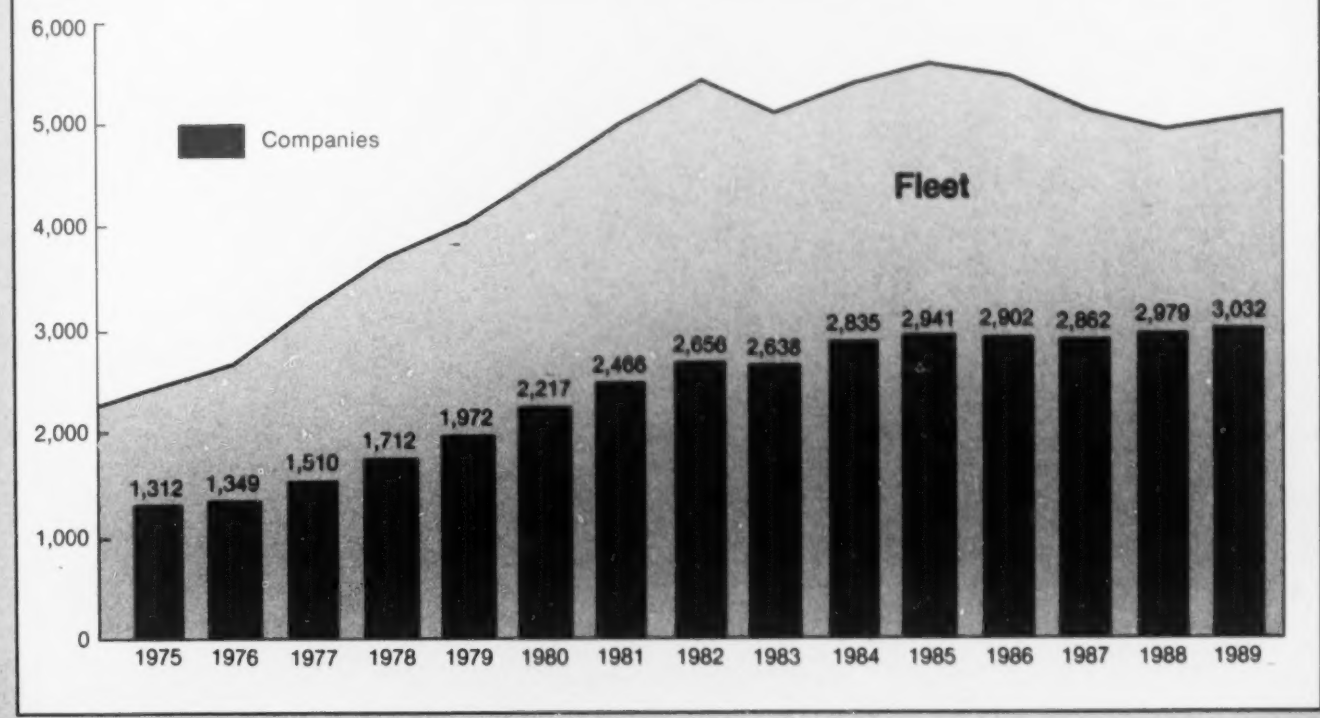


TABLE 2-7

NBAA Five-Year Safety Awards Summary (1985-89)

Awards	Number	Hours/Years
Corporate Flying safety award to member companies whose aircraft have flown in excess of 3 or more consecutive accident-free years.	849 Companies	17,054,577 Hours
Commercial Flying safety award to member companies whose aircraft have flown in excess of 3 or more years consecutive accident-free years in a non-scheduled, revenue producing capacity.	65 Companies	1,431,974 Hours
Pilots Member company pilots who have flown corporate aircraft in excess of 1,500 accident-free hours.	5,062 Pilots	29,501,711 Hours
Maintenance Departments Member companies who qualify for Corporate or Commercial Safety Award and perform their own maintenance.	294 Companies	
Maintenance/Avionics Technicians Member company technicians who have been employed 3 or more years in support of corporate/business flight operations.	2,402 Technicians	30,893 Years

In 1989 a new award was added for support and service personnel (dispatchers, refuelers, clerical, etc.) in aviation departments. To earn this award an aviation department member must be employed by a company for three years in a time period when the company does not have an accident. A total of 373 people accumulated 3,462 safe support years in the first year the award was granted.

The NBAA Flying Safety Awards Program is sanctioned by the National Safety Council.

SECTION 3

Industry Statistics

This section gives an overall view of the world business and general aviation marketplace, world sales figures and Fortune 500 composition.

TABLE 3-1
World Business Aircraft Fleet— June 30, 1989
(June 30, 1988, in Parentheses)

Region	Jets	Turboprops	Total	%
Africa	164 (156)	268 (255)	432 (411)	3.0 (2.9)
Asia	225 (218)	215 (199)	440 (417)	3.1 (3.0)
Central America	267 (221)	214 (202)	481 (423)	3.3 (3.0)
Europe	787 (706)	880 (830)	1,667 (1,536)	11.6 (10.9)
North America	4,686 (4,684)	5,455 (5,580)	10,141 (10,264)	70.5 (72.7)
Oceania	91 (81)	172 (149)	263 (230)	1.9 (1.6)
South America	285 (242)	669 (590)	954 (832)	6.6 (5.9)
Totals	**6,505** (6,308)	**7,873** (7,805)	**14,378** (14,113)	**100** (100)

Source: Interavia Magazine/Aviation Data Service

Business aircraft have shown steady growth worldwide to ever-expanding markets.

TABLE 3-2
Worldwide Shipments of New Aircraft by Manufacturer (1987-1989)

Company	Calendar Years 1987	1988	1989
Aerospatiale	81	97	121
Beech	314	372	371
British Aerospace	100	102	118
Britten-Norman	29	15	9
Canadair	13	22	20
Cessna	187	161	183
Christen	N/A	N/A	75
Dassault	49	43	32
De Havilland	30	46	54
Embraer	146	84	142
Fairchild	39	29	13
Gulfstream	30	51	40
Israel Aircraft Ind.	5	8	11
Lake	23	28	23
Learjet	16	23	25
Maule Air	54	55	35
Mooney	143	142	143
Piper	282	282	621
Short	15	7	N/A
Total	**1,556**	**1,567**	**2,036**

Source: Weekly of Business Aviation Newsletter

The average costs for new aircraft in 1990 according to the *Business and Commercial Aviation Planning and Purchasing Handbook* for certain models were as follows:

Twin-piston (6 models)	$ 461,000
Turboprop (16 models)	$4,008,000
Turbojet (20 models)	$9,161,000

TABLE 3-3
Average Age of Fortune 500 Fleet (1988)

Type	Age	Number of Aircraft
Heavy Jets	9.75	318
Medium Jets	8.96	551
Light Jets	12.07	17
Heavy Turboprops	24.10	39
Medium Turboprops	9.80	212
Single-Engine Turbine Helicopters	10.32	66
Twin-Engine Turbine Helicopters	9.65	91

The traveling public has become increasingly aware of the aging process in aircraft in recent years. The average age of most business aircraft in the Fortune 500 fleet is less than 10 years. Aircraft with the highest average, heavy turboprops (24.7 years), are gradually being phased out of both the Fortune 500 and NBAA fleets which parallel each other. Over eighty-five percent of Fortune 500 companies with aircraft are NBAA members. The General Aviation Manufacturers Association's analysis for all twin-engine aircraft show average age for twin-piston aircraft to be 23.3 years; for turboprops, 12.0 years; and for turbojets, 12.5 years.

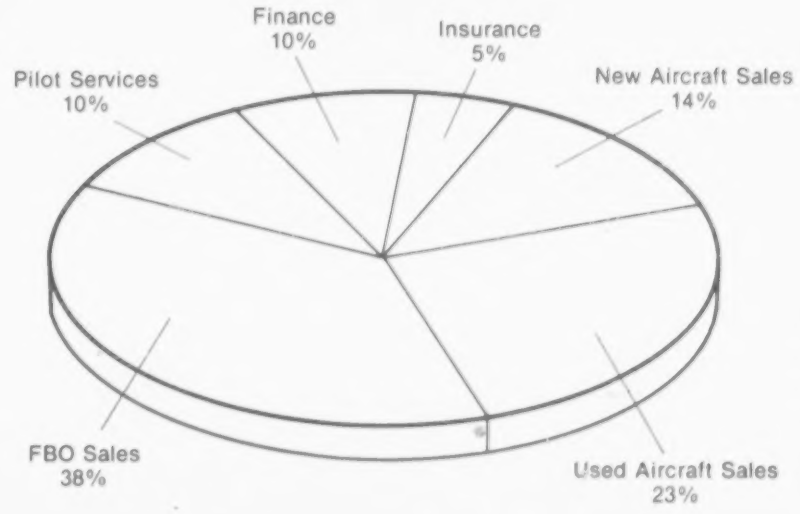
Source: Business and Commercial Aviation Magazine/Aviation Data Service, General Aviation Manufacturers Association.

TABLE 3-4
Fortune Industrial 500, Composite Comparison (1988)
(Those With Aircraft vs. Those Without)

	Business Aircraft Operators	Non-Operating Companies
Number of Companies	332	168
Number of Employees	11.2 million	1.5 million
Net Sales	$1.8 trillion	$209.2 billion
Assets	$1.9 trillion	$164.2 billion
Net Income	$104.6 billion	$10.4 billion
Stockholder's Equity	$640.6 billion	$57.0 billion
Average Sales Per Employee	$162.282	$136,699
Average Net Income as a Percent of Sales	5.8%	4.0%
Average Net Income Per Employee	$9.356	$6,783
Average Net Income as a Percent of Stockholder's Equity	16.3%	18.2%

Source: Business and Commercial Magazine/Aviation Data Service

GRAPH 3-1
General Aviation Market—Shares



Size of the general aviation marketplace is over $15 billion. Since most business flights are non-revenue flights, they do not show up as a factor in this graph.

Source: Transportation Research Board

SECTION 4

Operational Statistics

This section delves into the numbers of aircraft, hours and miles flown, utilization, fuel, number of pilots, safety figures and a few facts about airports.

TABLE 4-1

1988 General Aviation Nautical Miles Flown in U.S. by Primary Use

(Nautical Miles in Thousands)

Aircraft Type	Corporate	Business	Personal	Industrial*	Commuter Carrier	Air Taxi	Other	Total
Piston	94,553	584,875	1,101,956	703,678	48,032	223,003	30,394	2,786,491
Turboprop	202,275	42,764	2,205	11,907	125,596	63,947	8,885	457,579
Turbojet	542,211	34,988	4,215	58	1,026	80,585	15,152	678,235
Rotorcraft	60,455	6,975	3,851	67,700	5,861	27,753	28,318	200,913
Other	42	2,213	13,614	1,757	0	0	230	17,056
Totals	**899,536**	**671,815**	**1,125,841**	**785,100**	**180,515**	**395,288**	**82,979**	**4,140,274**

The categories of corporate, business and air taxi (the categories usually characterized as "business") accounted for 2 billion miles, or half the general aviation total.

*"Industrial" category is composed of instructional, aerial observation, aerial application and other work.

Source: FAA General Aviation Activity and Avionics Survey

TABLE 4-2

1988 General Aviation Total Hours Flown by Aircraft Type and Primary Use in U.S.

(Thousands)

Aircraft Type	Corporate	Business	Personal	Industrial**	Commuter Carrier	Air Taxi	Other	Total
Piston	781	4,590	10,413	8,081	336	1,719	306	26,226
Turboprop	1,066	195	12	75	648	306	68	2,370
Turbojet	1,346	90	10	2	3	194	32	1,677
Rotorcraft	551	78	59	853	131	622	410	2,704
Other	4	7	319	263	81	0	19	693
Totals	**3,748**	**4,960**	**10,813**	**9,274**	**1,199**	**2,841**	**835**	**33,670**

The business aviation categories of corporate, business and air taxi account for 34.3% of all general aviation flight hours.

*"Industrial" category is composed of instructional, aerial observation, aerial application and other work.

Note: Columns differ from totals due to estimation process.

Source: FAA General Aviation and Activity Survey

TABLE 4-3

1988 General Aviation Active Aircraft by Primary Use in U.S.

Aircraft Type	Corporate	Business	Personal	Industrial*	Commuter Carrier	Air Taxi	Other	Total
Piston	3,270	33,495	116,273	26,796	451	4,675	2,596	187,556
Turboprop	3,240	648	129	145	402	484	211	5,259
Turbojet	3,337	197	79	18	5	398	153	4,187
Rotorcraft	991	468	935	2,179	113	962	758	6,406
Other	44	110	5,141	1,177	2	0	383	6,857
Totals	**10,882**	**34,918**	**122,557**	**30,318**	**973**	**6,518**	**4,101**	**210,267**

About one-fourth of general aviation aircraft are engaged in business aviation in the categories of corporate, business and air taxi.

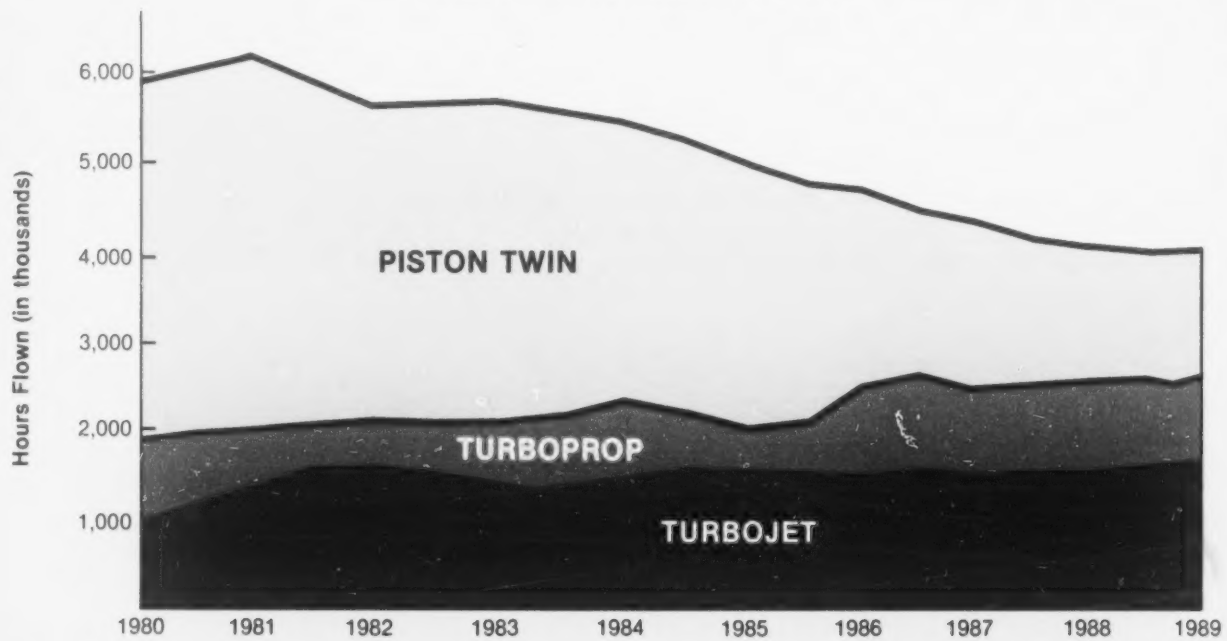
*"Industrial" category is composed of instructional, aerial observation, aerial application and other work.

Note: Columns differ from totals due to survey procedure and estimation process.

Source: FAA General Aviation Activity and Avionics Survey

GRAPH 4-1

Hours Flown by Type of Aircraft



Although cumulative general aviation hours flown are down slightly (the hours flown by turbojet and turboprop aircraft), the aircraft most associated with business aviation are either staying the same or improving.

GRAPH 4-2

Utilization Rates for NBAA Jet and Turboprop Fleets

(Annual Average Utilization Per Aircraft)

Figure 1. JET FLEET

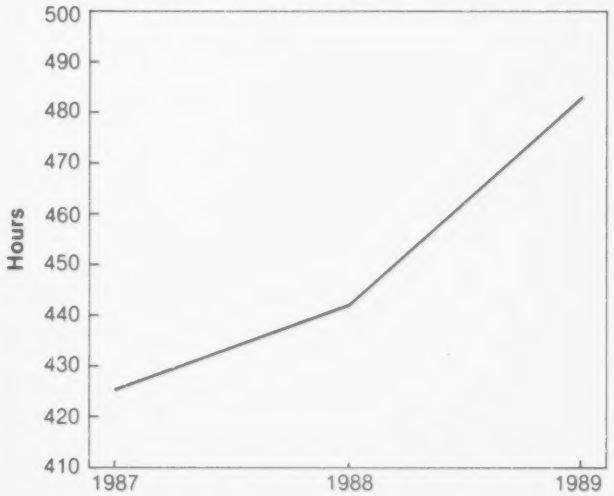
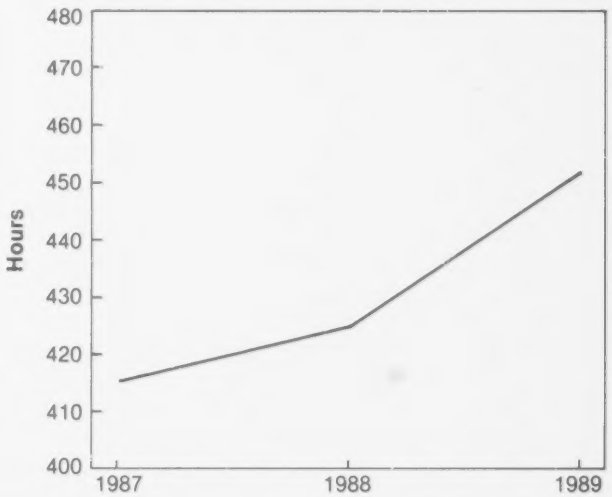


Figure 2. TURBOPROP FLEET



GRAPH 4-3

Utilization Rates for NBAA Reciprocating Engine and Helicopter Fleets

(Annual Average Utilization Per Aircraft)

Figure 3. RECIPROCATING ENGINE FLEET

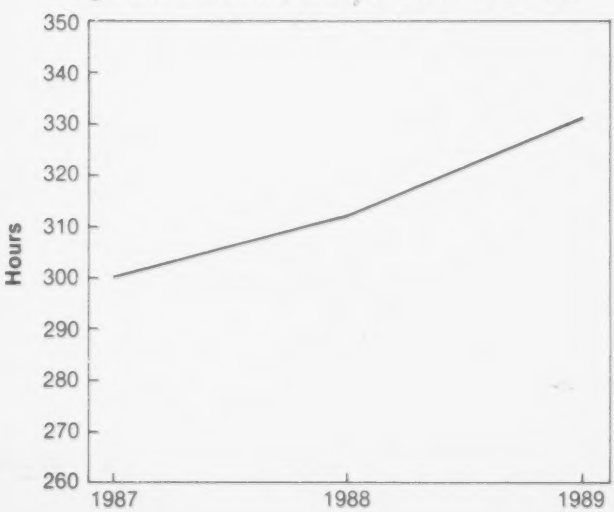
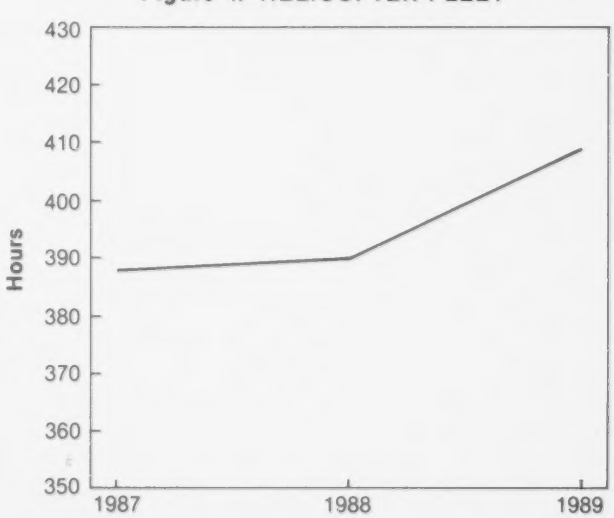


Figure 4. HELICOPTER FLEET



Notes for Graphs 4-2 and 4-3

Graphs 4-2 and 4-3 are based on a January 1989 survey of NBAA Business and Corporate members. These charts are based on more than 1,100 NBAA operators' responses. 1989 data is operators' projections.

Source: NBAA Business Aviation Issues, April 3, 1989, Edition #89-3.

TABLE 4-4

Top 30 Airports by Total Operations (1988)

(Thousands)

Airport	Total Operations	1986 Rank	1986 Operations
1. Chicago O'Hare	795.7	1	794.8
2. Atlanta	782.7	2	774.8
3. Dallas/Ft.Worth	664.3	3	575.2
4. Los Angeles International	631.9	4	565.2
5. Orange County/John Wayne	528.2	5	540.1
6. Denver Stapleton	511.3	6	520.7
7. San Francisco International	461.2	9	422.7
8. Van Nuys,California	459.7	7	472.4
9. Phoenix Sky Harbor	455.2	12	412.3
10. Boston Logan	445.2	10	420.1
11. Long Beach, California	435.3	16	397.2
12. St. Louis International	429.4	8	460.5
13. Ft.Worth-Meacham	425.0	N/L	N/L
14. Philadelphia	415.6	19	368.2
15. Seattle Boeing Field	414.1	15	400.1
16. Charlotte, Douglas	405.2	25	361.2
17. Oakland	402.3	18	370.9
18. Pittsburgh	386.9	20	365.6
19. Detroit	380.2	13	405.9
20. Minneapolis/St. Paul	379.8	14	401.8
21. Pontiac	379.5	22	364.3
22. Newark	376.8	11	413.6
23. Las Vegas	372.6	26	352.2
24. Denver/Centennial	371.8	24	363.6
25. Honolulu	367.1	23	363.9
26. New York LaGuardia	364.2	21	365.2
27. Memphis	358.8	17	380.3
28. Miami International	358.4	28	345.3
29. San Jose	355.6	27	348.8
30. New York Kennedy	328.6	29	326.6

N/L = Not listed in top thirty in 1986
Operation = one takeoff or landing

Washington National was a close 31st with 327,600 operations followed by Seattle-Tacoma with 311; Baltimore with 304,000; Houston Intercontinental with 297,300 and Chicago Midway with 296,200. Total at 398 FAA-operated air traffic control towers in 1988 was 61.299 million operations.

TABLE 4-5
Corporate/Business Aircraft Utilization (1988)

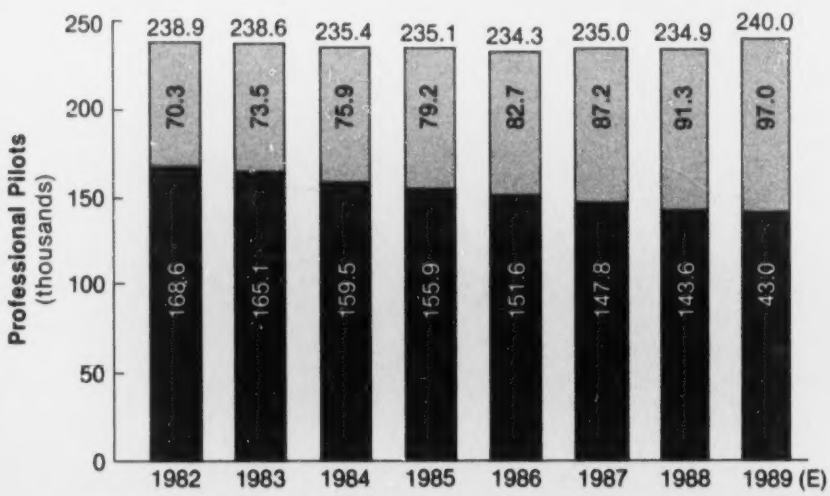
Aircraft Type	Average Load Factor*[1]	Average Stage Length (NM)**[2]	Hours Flown Per Year
Gulfstream G-II/-III/-IV	5.80	953	534
Canadaire Challenger 600/601	3.67	677	499
Lockheed JetStar	4.16	556	429
Falcon 50	5.03	688	551
Rockwell Sabreliner	2.60	478	331
BAe-HS-125-600/700/800	3.87	554	492
Falcon 20/200	4.58	532	455
Learjet 55	3.56	457	535
Cessna Citation III	3.06	515	522
IAI Westwind I/II	3.25	570	463
Learjet 30 Series	3.46	607	430
Falcon 10/100	3.04	526	475
Cessna Citation I/II	3.47	345	457
Heavy Turboprops (All)	6.55	256	495
Beech King Air 200/300	3.41	348	387
Beech King Air 90/100	4.05	313	450
Piper Cheyennes (All)	2.98	288	368
Cabin Class Piston Twins	1.70	176	303
Turbine Helicopters	2.60	56	499

Source: Business and Commercial Aviation Magazine, August 1988

"Higher utilization" are two watchwords in business aviation. Many operators, as indicated here, are averaging more than 500 hours for jet aircraft. More utilization goes a long way toward making an aircraft and aircraft operations more attractive on a company's balance sheet. NBAA member company aircraft fly significantly more hours per year per aircraft than do those of non-member aircraft operators.

*Based on passenger-carrying flights only.
**NM = Nautical miles.
[1] Number of passengers on board.
[2] Average length from takeoff to touchdown of a single flight leg.

GRAPH 4-4
U.S. Professional Pilot Population



Commercial Rated Pilots

Airline Transport Rated Pilots

The expected need for more airline pilots in the 1990s should attract more students and should be an incentive for present pilots to improve their skills and ratings. The pilot shortage predicted for the mid-1990s may not occur.

Source: FAA Statistical Handbook of Aviation

(E) = Estimated as of January 1

TABLE 4-6

General Aviation Aircraft Fuel Consumption

(In Millions of Gallons)

Fiscal Year	*Fixed Wing*				*Rotorcraft*			
	Piston							
Historical	Single Engine	Multi Engine	Turboprop	Turbojet	Piston	Turbine	Other	Total
1985	249.4	178.4	210.2	433.2	8.7	58.9	0.1	1,138.9
1986	242.0	157.8	230.0	451.4	11.0	56.7	0.1	1,149.0
1987	236.5	148.5	197.3	409.4	10.1	55.4	0.1	1,057.3
1988	235.4	148.5	189.1	409.4	10.1	55.4	0.1	1,048.0
1989E	236.5	130.3	197.3	435.0	7.2	79.6	0.2	1,086.0
Forecast								
1990	236.5	127.3	205.5	460.6	7.2	79.6	0.2	1,116.8
1991	237.5	124.2	213.7	486.2	7.2	90.0	0.2	1,159.0
1992	238.6	124.2	221.9	511.8	7.2	103.8	0.2	1,207.7

Source: FAA Forecast 1990 (Fiscal year begins October 1)

TABLE 4-7

Total Aircraft Operations At Airports with FAA Traffic Control Services

(In Millions—Except FAA Towers)

Fiscal Year	Air Carrier	Air Taxi/ Commuter	General Aviation	GA % of Total	Military	Total	Number of FAA Towers
Historical							
1988	12.8	8.3	37.5	61.2	2.8	61.3	399
1989E	12.5	8.3	37.8	61.6	2.8	61.4	399
Forecast							
1990	13.1	8.7	38.2	60.1	2.8	62.8	400
1991	13.6	9.1	39.0	60.5	2.8	64.5	400
1992	14.1	9.6	40.0	60.2	2.8	66.5	400

Source: FAA Forecast 1990 (E) = Estimate

The general aviation forecasts above predict a steady increase in fuel consumption and air traffic operations in the coming years.

TABLE 4-8

Business and Corporate Aviation Accident Statistics (1985-1989)

	Accidents (1)	Fatal Accidents	Accidents Per 100,000 Hours		
			Fatalities	Total	Fatal
Business:					
1985	257	58	116	3.934	0.888
1986	183	55	122	2.824	0.849
1987	175	43	86	3.070	0.754
1988	158	50	90	1.180	0.887
1989 (P)	162	44	93	3.230	0.848
			5 Yr. Averages	2.84	0.845
Corporate:					
1985	37	13	34	0.886	0.311
1986	19	5	18	0.458	0.120
1987	19	5	18	0.558	0.147
1988	6	0	0	0.160	0.000
1989 (P)	8	4	7	0.210	0.110
			5 Yr. Averages	0.454	0.137

Hours Flown

	1985	1986	1987	1988	1989 (E)
Business:	6,533,000	6,480,000	5,700,000	4,960,000	5,010,000
Corporate:	4,175,000	4,150,000	3,400,000	3,748,000	3,780,000
	10,708,000	10,630,000	9,100,000	8,708,000	8,790,000

NOTES:
(1) NTSB Figures (E) Estimate All Data For 1989 Are Preliminary (P)

TABLE 4-9

General Aviation Accident Rates (1985-1989)

Year	Total	Fatal	Fatalities	Estimated Aircraft Hours Flown	Accident Rates Per 100,000 Aircraft Hours	
					Total	Fatal
1985	2745	500	957	30,589,905	8.974	1.635
1986	2568	466	958	30,361,000	8.458	1.535
1987 (P)	2471	435	830	29,208,000	8.46	1.49
1988 (P)	2332	438	782	29,350,000	7.95	1.49
1989 (P)	2167	420	763	29,900,000	7.25	1.40

TABLE 4-10

Accidents of Air Carriers Operating Under CFR 135 (1989) (Air Taxi)

Accidents			Estimated Aircraft Hours	Accident Rates Per 100,000 Aircraft Hours	
Total	Fatal	Fatalities		Total	Fatal
18	5	31	2,040,000	0.882	0.245
110	23	80	2,870,000	3.83	0.80

NOTES:
(1) NTSB Figures (E) Estimate (2) FAA Figures All Data For 1989 Are Preliminary (P)

TABLE 4-11

Scheduled and Non-Scheduled Commercial Air Carrier Accident Statistics (1985-1989)

	Accidents			Aircraft Hours Flown	Accident Rates	
Year	Total	Fatal	Fatalities		Total	Fatal
1985	22	7	526	8,709,894	0.253	0.080
1986	23	2	4	9,918,189	0.222	0.010
1987	36	5	232	10,534,200	0.332	0.038
1988	32	3	285	10,998,410	0.282	0.018
1989	28	11	278	11,050,000	0.253	0.100

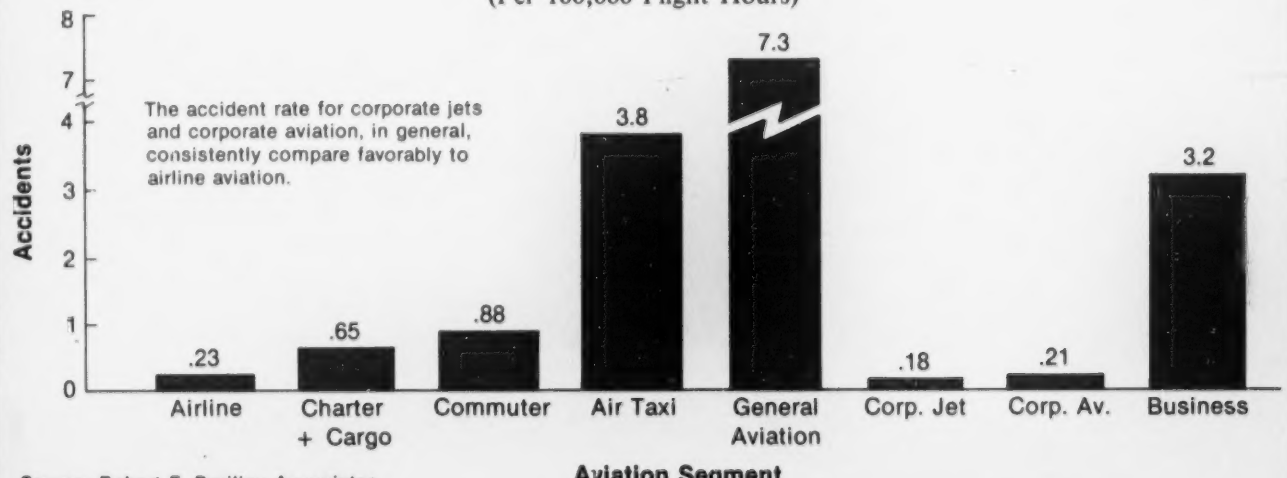
NOTES:
(1) Preliminary Data
(2) Suicide/sabotage cases are included in "Accidents" and "Fatalities" but not in "Accident Rates."

Source: NTSB/FAA

GRAPH 4-5

Accident Rate Comparison (1989)

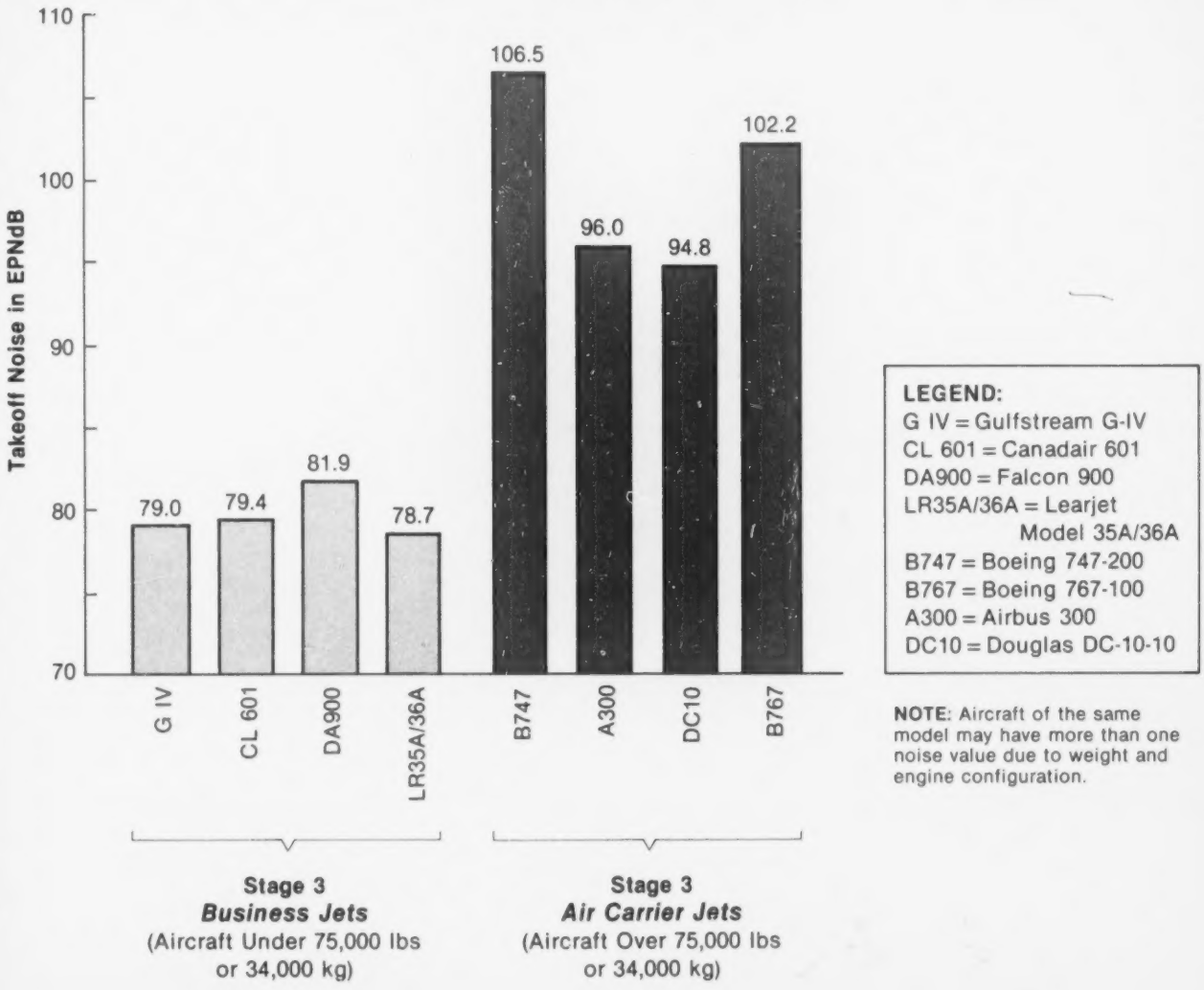
(Per 100,000 Flight Hours)



Source: Robert E. Breiling Associates

GRAPH 4-6

Aircraft Noise Comparisons—1

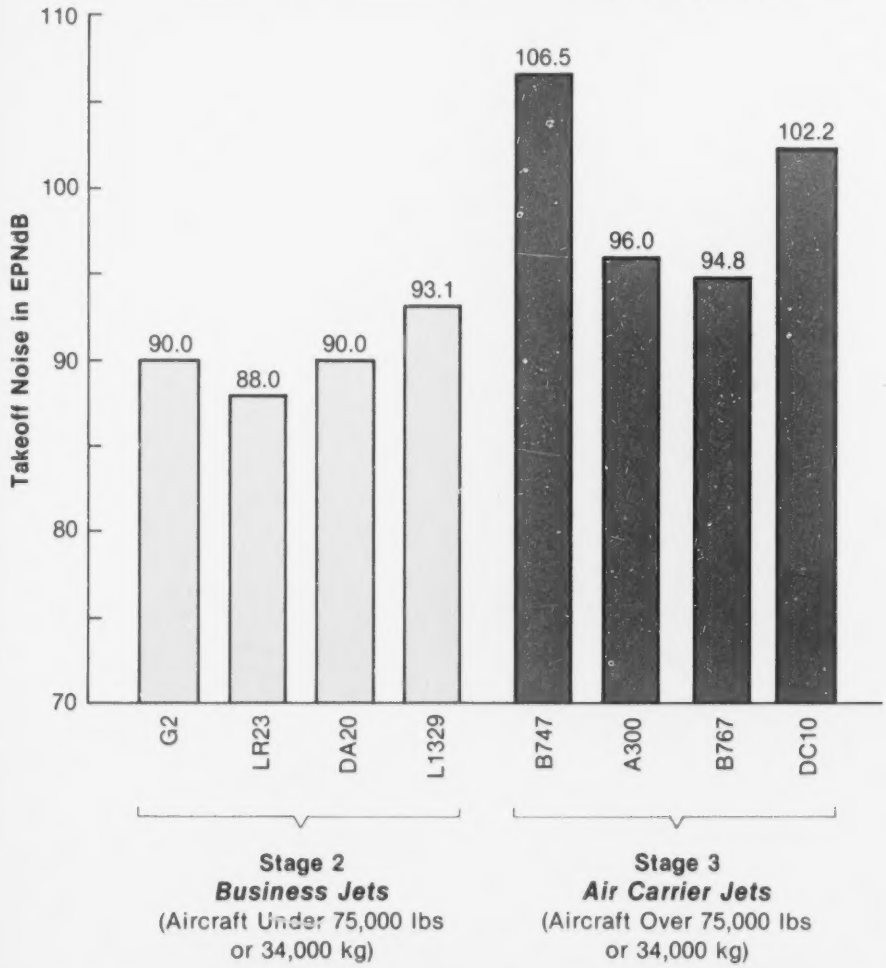


Notes for Graphs 4-6, 4-7 and 4-8

As might be expected, Stage 3 business jets are quieter than Stage 3 air carrier jets (GRAPH 4-6). Stage 2 business jets are also quieter than Stage 3 air carrier jets (GRAPH 4-7). This should not be surprising. For the most part, business jets weigh less than 75,000 pounds (34,000 kilograms). Lighter aircraft make less noise. Perceived takeoff noise for business jets are also less than air carrier aircraft in most cases as shown in GRAPH 4-8. This is why NBAA pressed for a 75,000 pound exemption for business aircraft from new European Community rules which would have automatically barred *all* Stage 2 aircraft. Ninety-nine percent of NBAA member aircraft meet the quieter noise standards of FAR 36, Stage 2 and Stage 3.

Source for Graphs 4-6, 4-7, 4-8: FAA Advisory Circular 36-1E

GRAPH 4-7
Aircraft Noise Comparisons—2



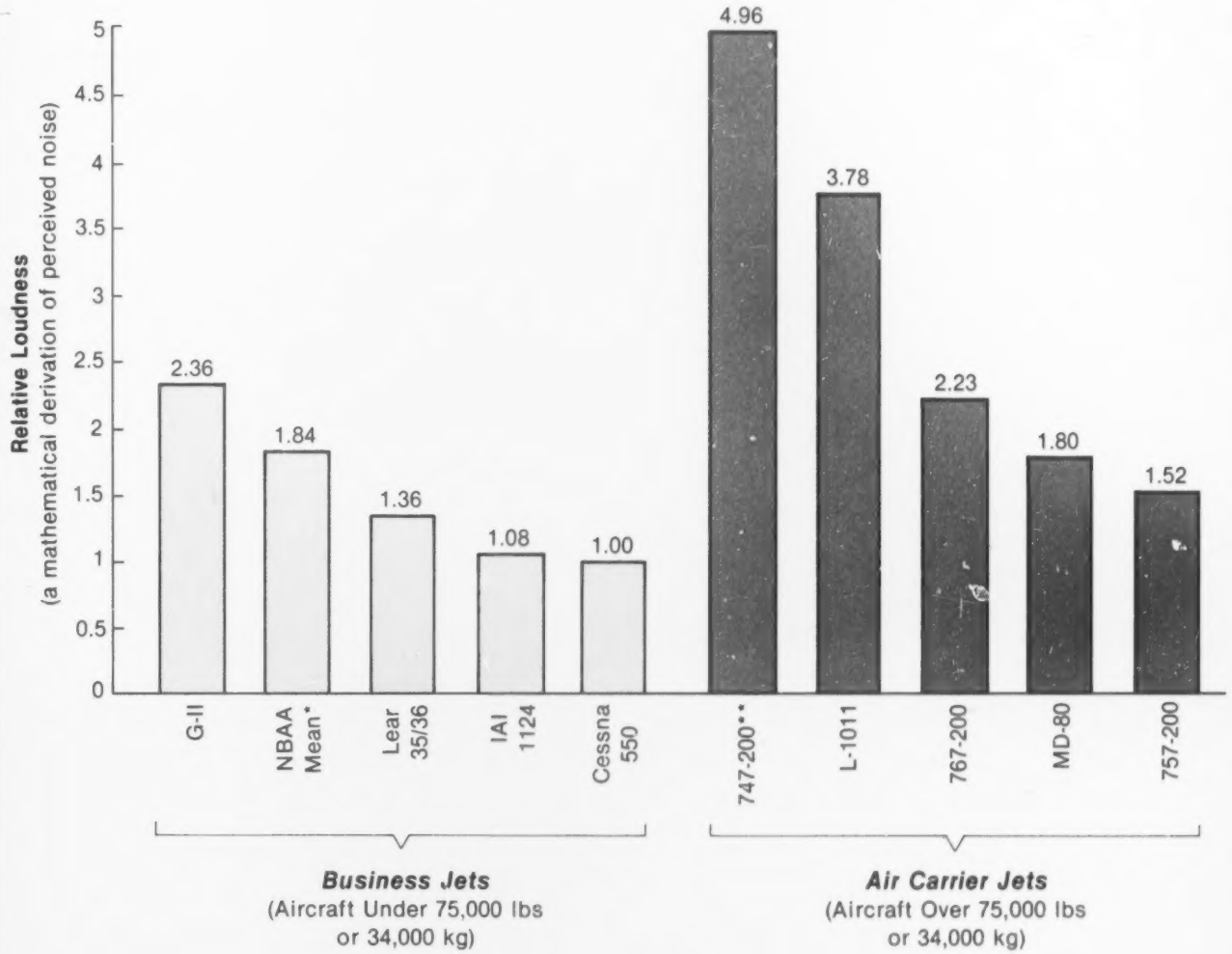
LEGEND:
G2 = Gulfstream G-II
LR23 = Learjet Model 23
DA20 = Falcon 20
L1329 = Lockheed Jetstar
B747 = Boeing 747-200
A300 = Airbus 300
B767 = Boeing 767-100
DC10 = Douglas DC-10-10

NOTE: Aircraft of the same model may have more than one noise value due to weight and engine configuration.

For notes on this graph, see page 19.

GRAPH 4-8

Loudness of Takeoff Noise for Typical NBAA Models and Air Carrier Stage 3 Models



* Average noise energy generated by all NBAA jet aircraft under 75,000 lbs/34,000 kg.

** The average 747-100 would equate to 6.82 on this scale.

LEGEND:

G-II = Gulfstream II	L-1011 = Lockheed
Lear 35/36 = Learjet	767-200 = Boeing
IAI 1124 = Westwind	MD-80 = McDonnell Douglas
Cessna 550 = Citation II	
747-200 = Boeing	757-200 = Boeing

For notes on this graph, see page 19.

GRAPH 4-9
Membership Count—
NBAA Member by State

This map shows the location of the more than 3,000 member companies of NBAA as of March 31, 1990. In addition, there are more than 100 members located in countries outside the United States.

Business Aviation Handy Pocket Facts

For more information—statistics, operations, maintenance, safety, legislative both national and state-members should contact: National Business Aircraft Association, 1200 18th St., N.W., Washington, D.C. 20036. Tel. 202-783-9000; FAX 202-331-8364; Telex 904-186.

Tear out this card at the perforation, fold and carry with you for handy information about NBAA and operations.

Phone Numbers

CFCF* Operations ..... (202) 267-5500
CFCF Cluster (Severe Weather) ... (202) 267-5315
CFCF NWS
(National Weather Service)..... (202) 267-5317
ARO (Reservations) ..... (800) FAA-1212
Dept. of State Traveler Hot Line .. (202) 647-5225
U.S. Naval Facility Permit ..... (202) 325-0475
U.S. Air Force Facility Permit .... (202) 697-5967
To report an accident call
NTSB Communications Center ... (202) 863-5100

Toronto Reservations

Advance reservations (2 calendar days max.) (416) 676-4553 between 0900 to 2200L (1400 and 0300Z).

Only one arrival and departure can be booked per phone call. Turnarounds not permitted within the same hour between 1600 and 1859L.

**Central Flow Control Facility*

TABLE 2-3
Top Twenty NBAA Bases of Operation

	% of NBAA Use
1. New York City/New Jersey (includes Teterboro, White Plains, Newark)	5.0%
2. Los Angeles (includes Long Beach, San Bernardino)	3.5%
3. Dallas (includes Ft. Worth)	3.4%
4. Houston	2.2%
5. District of Columbia (includes Baltimore)	2.2%
6. Miami	2.1%
7. Atlanta	2.0%
8. Chicago (includes Elkhart & Waukegan)	1.8%
9. San Francisco (includes Oakland)	1.6%
10. Denver	1.5%
11. Cleveland (includes Akron)	1.5%
12. Minneapolis/St. Paul	1.4%
13. St. Louis	1.2%
14. Detroit (includes Toledo)	1.2%
15. Wichita	1.2%
16. Boston	1.1%
17. Philadelphia	1.0%
18. San Antonio	1.0%
19. Richmond	1.0%
20. Columbus	1.0%

NBAA member aircraft are based near corporate headquarters in the largest cities. This table includes aircraft based within fifty miles of the metropolitan areas mentioned. For a complete summary of NBAA member locations by state, see the map titled GRAPH 4-9 Membership Count—NBAA Members by State.

TABLE 2-6
NBAA Annual Meeting And Convention Schedule

Date	Place
1990 October 3-5	New Orleans
1991 October 29-31	Houston
1992 September 22-24	Dallas
1993 September 21-23	Atlanta
1994 October 4-6	New Orleans

NBAA convention sites are limited to a few cities that can accommodate the large exhibit area and hotel room requirements of this ever-expanding display of commercial aviation products and services.

TABLE 3-1

World Business Aircraft Fleet — June 30, 1989

(June 30, 1988, in Parentheses)

Region	Jets	Turboprops	Total	%
Africa	164 (156)	268 (255)	432 (411)	3.0 (2.9)
Asia	225 (218)	215 (199)	440 (417)	3.1 (3.0)
Central America	267 (221)	214 (202)	481 (423)	3.3 (3.0)
Europe	787 (706)	880 (830)	1,667 (1,536)	11.6 (10.9)
North America	4,686 (4,684)	5,455 (5,580)	10,141 (10,264)	70.5 (72.7)
Oceania	91 (81)	172 (149)	263 (230)	1.9 (1.6)
South America	285 (242)	669 (590)	954 (832)	6.6 (5.9)
Totals	**6,505** (6,308)	**7,873** (7,805)	**14,378** (14,113)	**100** (100)

Source: *Interavia Magazine/Aviation Data Service*

Business aircraft have shown steady growth worldwide to ever-expanding markets.

TABLE 4-4

Top 30 Airports by Total Operations (1988)

(Thousands)

Airport	Total Operations	1986 Rank	1986 Operations
1. Chicago O'Hare	795.7	1	794.8
2. Atlanta	782.7	2	774.8
3. Dallas/Ft Worth	664.3	3	575.2
4. Los Angeles International	631.9	4	565.2
5. Orange County/John Wayne	528.2	5	540.1
6. Denver Stapleton	511.3	6	520.7
7. San Francisco International	461.2	9	422.7
8. Van Nuys California	459.7	7	472.4
9. Phoenix Sky Harbor	455.2	12	412.3
10. Boston Logan	445.2	10	420.1
11. Long Beach, California	435.3	16	397.2
12. St. Louis International	429.4	8	460.5
13. Ft Worth Meacham	425.0	N/L	N/L
14. Philadelphia	415.6	19	368.2
15. Seattle Boeing Field	414.1	15	400.1
16. Charlotte, Douglas	405.2	25	361.2
17. Oakland	402.3	18	370.9
18. Pittsburgh	386.9	20	365.6
19. Detroit	380.2	13	405.9
20. Minneapolis/St. Paul	379.8	14	401.8
21. Pontiac	379.5	22	364.3
22. Newark	378.8	11	413.6
23. Las Vegas	372.6	26	352.2
24. Denver/Centennial	371.8	24	363.6
25. Honolulu	367.1	23	363.9
26. New York LaGuardia	364.2	21	365.2
27. Memphis	358.8	17	380.3
28. Miami International	358.4	28	345.3
29. San Jose	355.6	27	348.8
30. New York Kennedy	328.6	29	326.6

N/L = Not listed in top thirty in 1986

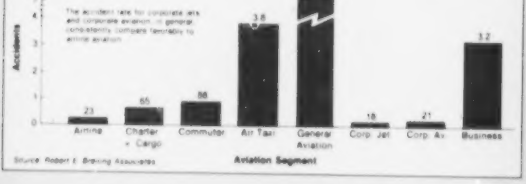
Operation = one takeoff or landing

Washington National was a close 31st with 327,600 operations followed by Seattle-Tacoma with 311. Baltimore with 304,000; Houston Intercontinental with 297,300 and Chicago Midway with 296,200. Total at 398 FAA-operated air traffic control towers in 1988 was 61.299 million operations.

GRAPH 4-5

Accident Rate Comparison (1989)

(Per 100,000 Flight Hours)



Source: Robert E. Brewing Associates

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